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ABSTRACT

This collection includes 16 conference papers and presentations and brief descriptions of 35 workshops and demonstrations. The document contains the following papers: (1) "Visual Literacy in the Elementary Grades" (David J. Bieman); (2) "Inservice Training for Sheridan's Audio Visual Staff" (Dave MacDougall); (3) "Auditorium Performance Criteria," with 16 charts and diagrams (Alan J. Powell), (4) "Do the 'Computer in the Classroom' Courses Change Teachers to Do a Better Job in the Classroom?" (Ray H. Topp); (5) "The State of the Art in the Use of Microcomputers in Elementary Education 1984" (Ray H. Topp); (6) "Robotics, Computers, Automation & You!" (Donald E. Coulman); (7) "Control Strategies and Image Placement Conditions in a Computer-Assisted Instructional Unit" (Robert M. Bernard and Claude Pineault); (8) "Naturalistic Evaluation in Action" (Mary F. Kennedy); (9) "Educational Media and Technology as a Social Inquiry: Teaching Instructional Communication as Social Science" (Stuart A. Selby); (10) "Introduction to the Production Process"; (11) "Television: A Distorted View" (Patricia A. Dolan Lewis, Richard F. Lewis); (12) "Educational Technology: Art or Science?" (Denis Hlynka); (13) "Duet: From a Pilot to a Reality"; (14) "The Role of Television in the Lives of Gifted Students" (D. J. Engel); (15) "Television Stereotypes as Role Models for North American Youth" (Nan-MacLeod-Engel); and (16) "The Brain and Educational Technology" (James J. La Follette). (LMM)

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# AMTEC '84 ... A Kaleidoscope of Media

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# Papers and Workshops

## June 17-20, 1984
## London, Ontario

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# VISUAL LITERACY IN THE ELEMENTARY GRADES

By
David J. Bieman, Media Co-ordinator
Huron County Board of Education

Visual Literacy has been on the periphery of curriculum concerns for a number of years but it has never really gained wide acceptance. We will examine some of the claims for its inclusion and discuss a practical application undertaken at the Huron County Board of Education.

Part of the problem is that while many people argue for the teaching of Visual Literacy, no one has clearly defined it, see Clayback et al (1980). Many proponents use the following definition:

> Visual literacy refers to a group of vision competencies a human being can develop by seeing at the same time he has and integrates other sensory experiences. The development of these competencies is fundamental to normal human learning. When developed, they enable a visually literate person to discriminate and interpret the visual actions, objects, and/or symbols, natural or man-made, that he encounters in his environment. Through the creative use of these competencies, he is able to communicate with others. Through the appreciative use of these competencies, he is able to comprehend and enjoy the masterworks of visual communication. (Platt, 1975)

This obviously is not very clear. It certainly will not promote an interest in the issue. The definition does tell us what a visually literate person can do, but not what visual literacy is. Spoerner has attempted to be more specific, but he illustrates another of the problems of this movement. "Visual literacy is a term promoted by art educators to describe our important goal of education". (1981, p. 36) Visual literacy is too often understood to be limited to the field of the Art educator. This unfortunately reduces its audience and its content. The few students who pursue Art become familiar with the visual art concepts of line, space, colour, texture, balance, etc. As I see it, this is only one aspect of visual literacy. As we come closer to understanding what it is, we will also see how it can be integrated across disciplines.

The term "literacy" itself has become overused and therefore unclear. While some educators talk of "computer literacy" others insist that "the crucial defining feature of literacy, the use of print", (Snow, 1983, p. 166) limits "literacy to a very narrow thing. I maintain that literacy for an individual depends on the unique attributes of his society. Our society presents more visual messages than any other type of message.

Later I will return to the problem of defining visual literacy. Now let us consider some of the arguments for teaching it.

Those who believe that visual literacy is necessary often base their claim on statistics of television viewing. Ruth (1976) summarized many of them; 4,000 hours before Grade 1, 15,000 hours by graduation, which is more time than they will have spent in school, very minimal reading that is not required, and both adults and children indicated that they are influenced more by non-print media than by print. There is a danger here of treating these generalizations as though they have specific application to each student. However this information should not be dismissed, but seen as a decriptor of our society.

Proponents of ivsual literacy often pose the analogous question, Does a fish know that it is wet?, to illustrate that we are so immersed in a visual society that we don't realize it.

Neil Postman has explored this in Teaching as a Conserving Activity. He steps outside of the "water" to view our "information environment". Even though he stressed in his book that schools are being asked to do too much now, he proposes that schools take on something new. "Of all the subjects one might study in the hope of gaining a liberated perspective, none is more useful than what I shall call here 'media ecology'." (1979, p. 185)

In an interview in Media and Methods magazine he expanded on this theme.

> My book is a plea for all teachers to be media educators. I am trying to define what the main concern of the teacher should be. And what I am saying is that every teacher must be an expert in the analysis of media, must know what sorts of experiences the children need to be provided with in school as a way of offsetting their preoccupation with the media outside of school. In that sense, this book is saying that the central problem of our time and in education is understanding media. (McLaughlin, 1980)

I believe that we must add this emphasis to our notion of visual literacy. So that now we have both Postman's concept of media ecology as well as the traditional artistic concepts of form, line, shape, etc. Clayback et al suggest that while many definitions exist, there is general agreement on the need to understand, use, and evaluate visual statements. (1980, p. 630)

They surmise that the varying definitions result from the diverse fields investigating it. In the references I mention a number of subject journals. I believe that the interest in so many fields supports my argument for the inclusion in school curriculum.

Postman alluded to the need for teachers to see their environment. There is an even more elemental need expressed by Freeman Patterson,

> The basic analytical skills (reading, writing, and arithmetic) are impressed upon us as being more important than the appreciation of direct experience, so we come to depend less and less on the part of the brain that encourages visual thinking. By Grades three or Four, many of us no longer regard painting or drawing as very important; we stop visualizing things freely and put word labels on everything we see. (1979, p. 10)

This is an important addition to our developing description of visual literacy. Along with media ecology and artistic pattern we must also include the notion of actually learning to see again.

Labelling is a great barrier to seeing. I believe that this is one of those concepts that appears to be so simple that it isn't appreciated. Most people really believe they know something if they can identify it, ie: that's a robin, that's a MacDonald's commercial. In our visually saturated, fast paced world, we must learn to pause and look beyond the identification stage to a better appreciation of what we are seeing. Audio visual people talk about the three levels of picture reading skills; Identification, Description and Inference. These are the skills of seeing which are part of my personal definition of visual literacy.

Let me briefly suggest some reasons why visual literacy has not received the attention it deserves. I have already mentioned the difficulties of definition, discipline specialization, the expanding curriculum, and teacher training. I believe there are other reasons as well.

Many educators believe that anything visual can be understood by anyone and no explanation is needed. This is not true even for a still photograph which is often more confusing to a student than is a line drawing. If you add motion, music, juxtaposition and any special effects, there is even more room for confusion. In fact, there is even less reason to expect members of an audience to receive the same message from a film, than there is if they were all to read the same book. The erroneous belief that visuals are simple has excluded them from serious discussion.

There is no denying the importance of the printed word. The world of academe and law revolve around it. However, many of the public are now moved to action and belief through the nebulous images of their television screen. The printed word just doesn't have the same import for them. Educators however, continue to treat the printed word as though it has greater importance to our clients than it does.

In our social context, television has come to be seen as entertainment. Many teachers are reluctant to use even television materials which include "subject content" as they feel that any television is inappropriate. To discuss it as anything more important requires a major change in thinking.

I suspect that two things in the 1960's had the effect of decreasing the credibility of media studies. The "probes" of Marshall McLuhan were seen by many academics as nonsense, while the media enthusiasts greeted him as a guru. The second thing that happened was that his ideas were welcomed in the alternative schools that were springing up at that time and many of them based part of their curriculum on his notions. I suspect that their acceptance had the reverse effect on the established educational systems.

Currently the back to the basics mood must also be seen as a limiting factor, though Postman and others would now argue that we should be going forward to the fundamentals.

Conflicting research can be used to prove that television is or is not making our children passive, violent, mindless consumers, or incapable of waiting for delayed gratification. Most research has been carried out by groups hoping to prove their position. Networks especially have "proven" that television does not alter behavior, yet they do manage to sell their commercial time to companies which expect the opposite!

Many of the media proponents have developed inappropriate models of media study. John Debes (1974) for one has promoted the concept of visual "grammar" complete with subjects, predicates and objects. He also has very direct connections with Eastman Kodak. A cynic may infer other purposes in his work.

Significantly, but not surprisingly, there has not been any public pressure from parents or the mass media for its inclusion in the curriculum.

Despite these negative influences, I foresee that visual literacy will develop momentum in the near future for the following reasons,

First, technological development is making it possible for teachers to present and evaluate visual presentations. The importance of the written word has come much from its availability for analysis. Now we can almost as easily call up any visual for reference.

The same technology is creating concern for the personalized media use that is now occurring. McLuhan argued that a book was an individualizing media, and the electronic ones provided mass involvement. New VCR's and personal stereos are again isolating the users. Of more concern is the material being used on the machines. The current furor over pornography, with its call for censorship of rock video etc. will generate a social pressure to deal with this problem in the school. As Spillman, Linder, and Goforth comment, "technological society is here, and not to control it is to be controlled by it". (1983, p. 295) That is an overly simplistic point of view, but one with a kernal of truth to it.

Second, organizations such as TV Ontario are working directly in the school system to promote what they call critical viewing. Through their network of Television Resource Teachers many Ontario teachers are becoming familiar with the concepts of visual literacy. Recently the National Film Board released the film Sequence and Story (White, 1983) which is a very practical resource for teachers who have had very little literacy training.

Third, many of the Ontario Ministry documents suggest the very use of media that I have been discussing. I recognize that not everything in a Ministry document is ever necessarily utilized, but the potential is there in such guides as Education in the Primary and Junior Divisions, Partners in Action, Science, and others.

Fourth, the trend toward integration of curriculum as proposed in the Ontario document, Language across the Curriculum, is establishing a climate in which teachers are becoming more willing to cross over some of the subject barriers.

Fifth, increasing awareness of the link between visual literacy, reading skills, and possibly even intelligence (Debes, 1974 & Holdaway 1979) will lead to integration of these skills in various subjects.

Finally, on-going curriculum research and development will simply prove the need for it and establish the benefits that could be achieved.

Despite all the difficulties and confusion, I believe there will continue to be an interest in visual literacy in our school curriculum. Postman has shown the need from his perspective, and if nothing else, the time kids spend watching TV demands some response from educators.

What is a realistic approach to achieving visual literacy? Postman recomends we evaluate media whenever it is available. "As a general rule I would say that no TV set or film projector or record player should be turned on in the classroom unless the teacher intends to call attention to how the medium affects the audience". (1979, p. 194) I should point out that for the most part, Postman would not accept the traditional uses of audio-visual material. I think it is unrealistic to expect teachers to follow his gneeral rule any more than they now apply it to a book, although that wouldn't be such a bad idea.

In Huron County we have taken some formal steps to include this material in our students school experience. A recently created K-6 Language Arts guideline Theory and Development, affectionately known as TAD, is in the implementation stage.

The traditional topics of Reading, Writing, Speaking, and Listening have been augmented by a section awkwardly titled Visual. While it is too early to accurately evaluate its impact, early indications are that it has been welcomed as a timely addition.

I suspect that we are missing an important element of childrens' development by dismissing the importance of the early experiences of children. Holdaway (1979) has pointed out the strong links between print literacy and the ability to grasp meaning from symbols. Much of a child's early practice in this is with television. As educators we should allude to this experience instead of lamenting the activity. In fact many primary teachers are making this link an important part of their reading program through the use of the new picture books. These delightful resources are using creative visual techniques to provide meaning for "readers" who explore them. This is a step not only to reading but also to visual literacy. Perhaps the teachers using them are not quite aware of the total benefit to their approach.

My definition of visual literacy is not yet complete. Inherent will be the notion of understanding how all media messages work, the traditional art concepts and a reawakened ability to see past the identification of something.

> Whether or not media studies per se, will ever be resurrected from the place where old educational ideas go to die remains a moot question. Whether or not the basics-minded will endure and prevail is subject to the whims of future trends in social and educational values. That the mass media will endure, with or without education remains the best bet. (Allen, 1980, p. 59)

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## INSERVICE TRAINING FOR SHERIDAN'S AUDIO VISUAL STAFF

by Dave MacDougall, Director of Audio Visual, Television and Technical Services

The purpose of the inservice program for our Audio Visual staff is to develop foundation skill levels in photographic, graphic art production, aduio production, equipment utilization, and preventative maintenance.

"Foundation skill" means that each staff member will not only be able to perform the correct procedures necessary to produce a product to a pre-determined standard, but will also possess a comprehension of the educational potential of each type of product produced.

The inservice training program was developed not only to ensure current competencies for our staff, but also extend the range of services each staff member can provide. The program ensures that our staff are capable of cross appointment, of promotion and of functioning effectively in an environment in which the creation of original learning resources is receiving increased priority.

Since some members of our Department are responsible for teaching formal classes within certain academic programs, they have developed teaching skills, learning resources and curricula. It seemed illogical therefore, not to extend our teaching program to include the professional development of all of our own staff.

In the summer of 1982, we closed the Audio Visual Centres each Friday and offered professional development as a series of workshop opportunities for our own staff. Most of the instructional expertise was provided by member of our staff. Post-mortem examination of the program revealed the need for a curricula based program with specific product or skills criteria which had to be completed by all staff members.

Possible personality conflicts in the evaluation process were avoided by offering a choice of two assessors with the Audio Visual Department Head as arbitrator. The program has continued each summer, Christmas and March Break, and we expect to successfully conclude the initial program this summer.

The professional development program has increased respect and understanding for the roles other members of staff in the department. It has fostered a greater sense of professionalism, and has improved staff management relationships.

# AUDITORIUM PERFORMANCE CRITERIA

by Alan J. Powell
McGill University
Instructional Communications Centre

Current restrictions on educational capital budgets have limited many construction projects to the renovation of outdated teaching facilities. A typical area of this work is renovation of auditoriums and large classrooms which were built before audiovisual facilities came into use. Projects of this type cover a number of different disciplines in design and a variety of trades in construction, so that design guidelines and performance criteria become critical to the success of the project. The paper attempts to analyse the performance criteria for the various disciplines in the design phase and suggests some techniques for performance measurement in the construction phase. The necessity for coordination between the professional disciplines is emphasized.

## Introduction

The design of effective audiovisual facilities for large group instruction in an auditorium presents the systems engineer with a wide range of technological problems and a unique opportunity to coordinate the activities of a number of different specialists.

The coordination work should include an analysis of the teaching process and teaching styles for different types of academic users. A design process and sequence should also be established which will provide a technological framework for design and construction projects. The framework should include design objectives and performance criteria for the different disciplines and some means of attempting to measure the performance of the various parameters. Also important is a means of rating the interaction of the disciplines and the final effect on the educational presentation in its various formats.

## The Technological Framework

A listing showing the range of technologies involved in the design of auditorium facilities for instruction should include:

1. Projection
2. Architecture
3. Lighting
4. Acoustics
5. Sound Systems
6. Television
7. Auxiliary Systems

### The Projection/Architecture Interface

Items 1 and 2 Projection/Architecture form an interface which should determine the dimensions and shape of the auditorium. These two technologies are closely related so that the significant factors and choices must be studied together.

Some of the factors involved in the Projection/Architecture interface include:

- room dimensions
- number of seats
- location and shape of seating pattern
- screen dimensions and position
- image sizes
- projection throw and angles
- viewing distances and angles
- lecturer's position(s) in the room

Figures 1 and 2 illustrate the geometry of front projection in an auditorium. The figures are extracted and developed from a paper by Justin, A N.Y. architect.

The plan view Figure 1 shows the geometrical relationships for front projection together with the determination of the optimum seating area and the minimum and maximum viewing distances a and b.

The elevation view Figure 2 shows the same relationships for two situations

- front projection from the booth
- front projection from the overhead projector

The critical factors here are $0_3$ the maximum vertical viewing angle from the front row of seats to the top of the screen and the projection angle from the overhead projector which determines the amount of keystone distortion on the projected image.

Then from the viewpoint of the projection/architecture interface a listing of performance criteria would read:

1. Ratios of minimum and maximum viewing distances a/w and b/w where w = image width
2. Maximum viewing angle (horizontal) (side seats)
3. Maximum viewing angle (vertical) (front seats)
4. Projection angle (booth) (keystone distortion)
5. Projection angle (overhead projector) (keystone distortion)

Note: The ratios of minimum and maximum viewing distances to image width (for optimum viewing) are different for photographic materials, television and computer displays.[2]

Lighting

Item 3 on the list of technologies is lighting and Figure 3 shows typical design objectives in two parts. Part 1 sets out the lighting tasks in order of pirority and Part 2 shows the approximate order of the design process.

The performance criteria could be listed in four(4) parts, all of which are important to the final presentation.

1. Lighting levels (ft candles)
   - Fluorescent - 50%
   - 100%
   - Incandescent (downlighting) - seats
   - walls
   - lecturer
   - Incandescent (highlighting) - lecturer
   - demonstration area
2. Lighting distribution (ft candles)
   (+ or - variations around the room)
3. Lighting control (ft candles) (ranges)
4. Stray light on the screen (ft Lamberts) (reflected)
   - O/H
   - slides
   - film

These parameters can all be measured with more orless difficulty and expense.

Acoustics

Item four(4) on the list of technologies is acoustics, and there are two parameters which are significant in the acoustical design of an auditorium.

1. Ambient noise (dba)
2. Reverberation time ($RT_{60}$) secs

Ambient Noise

The objective of an ambient noise specification concerns reduction of outside noise (by acoustical isolation) combined with an estimate of inside noise created by heating, ventilating and air conditioning equipment inside of the building. Typical figures for acceptable noise levels in unoccupied rooms of various types and functions are shown in Table 1 extracted from a standard reference work.[3]

Note that the recommended figure for auditoriums is 35-40 dba. Our experience at McGill is that it is quite difficult and quite expensive to get the ambient noise figure much below 40 dba. The figure of noise level is measured with a sound pressure level (SPL) meter which has specific characteristics, hence the term dba which refers to an a weighted characteristic. Figure 4 shows three (3) weighting characteristics a, b and c which are standardized in an American National Standard S1.4 (1971).

Reverberation Time ($RT_{60}$)

The second parameter which is significant in the design of an auditorium is reverberation time ($RT_{30}$) which concerns the provision of a satisfactory room reverberation characteristic in accordance with its physical volume (cu ft).

Reverberation is defined as the time taken for a sound in a room to die away by 60 decibels (db) after it has been turned off. Hence the $RT_{60}$.

Figure 5 shows an acceptable range of RT (secs) plotted against room volume (cu ft). The graph was extracted from a publication of the Acoustical and Board Products Manufacturer's Association. To relate these figures in practical terms, a typical 500 seat auditorium would have a room volume of 60,000 to 80,000 cu ft. so that the design objective for $RT_{60}$ would be in the range of 1.05 to 1.6 secs. The room volume can be estimated from architectural drawings and the graph can then be used as the basis for a design objective. In the case of an existing auditorium a measurement of $RT_{60}$ can be taken with a noise generator and spectrum analyser.

$RT_{60}$ can also be calculated if the room volume, surface areas and sound absorption coefficients of the different surfaces are knows. Under the conditions shown in the shaded area of the graph, speech intelligibility would be expected to be in the region of 90%.

The performance criteria for the acoustic parameters of an auditorium could then be summarized as:

1. Ambient noise not to exceed 40 dba.
2. Reverbration time $RT_{60}$ should be in accordance with its room volume, within the limits of the curve of Figure 5.

Sound Systems

Item five (5) in the list of technoligies is sound systems where the two principal bases for design are:

1. Operating Functional Design which is determined by user needs and economics.
2. Sound Reinforcement System Design which is intended to establish the intelligible transmission of speech in an acoustic space.

The operating functional design consists of the preparation of a functional diagram which shows:

- the main components
- the system connections
- the outlet boxes
- the operating features, such as mixing arrangements, recording and playback machines and remote controls for the instructor.

A simplified functional diagram is shown in Figure 6, and it is this diagram which gives us the opportunity to examine the design objectives for the total audiovisual system such as:

- double or single system
- location of the teaching position
- choice of active or passive podium
- types and numbers of controls such as slide controls for 1 or 2 projectors, video and audio trunks to the projection booth and facilities for self-operated recording and playback cassette machines.

The critical choice is the location of the teaching position(s) which must be coordinated from the viewpoints of the projection distance (throw), image size and projection angle of the overhead projector. The location of the conduits must also be coordinated with the electrical engineer to make sure that they come out in the right place.

Design objectives for the sound reinforcement system should include:

1. Satisfactory loudness
2. Good ratio of sound level to ambient noise
3. Good frequency response
4. Good speech intelligibility (good ratio of direct to reverberent sound)

The calculations for a proper design to achieve these objectives can be carried out with a knowledge of the acoustic distances of the system, the room acoustics and the directivity of the loudspeaker and microphone. [5]

The performance criteria of a sound reinforcement system are practically the same as the design objectives, with the overall objective for both being the intelligible transmission of speech in an acoustic space. The performance of the system can be measured for loudness, signal/noise ratio and frequency response with a sound pressure level meter and noise generator with the proper shape of characteristic. Cassette tapes are also available with the recorded noise for test purposes.

The measurement of speech intelligibility is not easy at the present time, but research work is going on in Europe [6] to develop equipment and techniques which will enable a figure of "Speech Transmission Index" to be assigned to a room after measurements have been taken.

A code of practice for the technique is also under discussion at the International Standards Committee level in IEC Technical Committee no. 84.

Television

Item Six (6) on the list is Television and from the viewpoint of television projection, the considerations for performance criteria are similar to the ones which were discussed in the section on the projection/architecture interface for photographic materials.

The differences are in the ratios of minimum and maximum viewing distances to image widths and the logistics of present day television projectors, where the expense of the equipment may dictate its use in a mobile rather than a permanent installation.

Some reference is made to these problems in a paper presented at the AMTEC '82 conference in Winnipeg and published in the proceedings.[2]

From the viewpoint of television production in an auditorium for special events, the principal considerations are:

1. Additional lighting over the performance area to conform to television production requirements in both lighting levels and colour temperature.
2. Electrical conduits to provide trunks for video feeds to the projection booth or wherever the recording or distribution of the event is taking place.

Note: The additional lighting over the performance area presents a problem of washing out the contrast on the presentation slides, making them difficult to televise. This situation must be carefully controlled.

Auxiliary Systems

The last item on the list of technologies which form the framework for auditorium facilities is auxiliary systems. This title refers to the miscellaneous facilities which go to make the auditorium a functional system for its teaching purposes. Typically this includes:

Two lecturer's podiums - one with the overhead projector in the centre of the room and a complete set of controls and one at the side of the stage area for lectures with no overhead projector or a special event type of activity.

The control facilities would be identical on each podium and would include:

- plug in for the lecturer's microphone
- microphone volume control
- single controls for 2 slide projectors
- dissolve controls for 2 slide projectors
- lecturer's illuminated pointer
- script lamp
- recording and playback facilities for audio cassettes
- video and audio trunks to the booth
- intercom telephone to the booth

The performance criteria for these facilities lies not just in allotting figures to each operating control and its function, but in the ergonomics or human engineering and packaging of the total facility with regard to the smooth operation and its simplified design as a teaching station. There are references to these principles in the bibliography. [7,8]

## Lighting Control and the Presentation Performance

That covers an attempt to set out the individual performance criteria for each of the technologies which were listed in the first section under "technological framework." The effect of lighting control on the final presentation performance should now be examined and an optimum method of control setting devised for best performance.

In the section on the projection/architecture interface, a technique was devised for choosing the optimum image size and screen dimensions. When this has been done, the effect on the final image can then be determined from two aspects:

1. The calculated light output of the projector.
2. The contrast of the image in relation to the required room light for a particular teaching function.

The formula for light output can then be used to set up Table 2 for an estimate of image contrast under three (3) different lighting conditions.

The figures of typical room lighting for the three principal educational formats should be noted from Table 2. The assumption of these figures is that they provide a satisfactory ambient room light and light on the task surfaces for notetaking, consistent with providing an acceptable stray light and contrast on the screen.

The question should tehn be asked: Is it likely that a professor who is keeping to a tight schedule and concerned about the content of his lecture will be able to achieve optimum contrast by adjustment of the various dimming controls? The answer is probably not, so that he should be given the opportunity to achieve optimum results without having to make any adjustments to the dimming controls. This can be achieved by designing a lighting control panel, illustrated in Figure 9, with manual dimming controls and with four (4) pre-set pushbutton controls, each of which selects a particular set of lighting conditions for a particular teaching function in the following sequence:

1. Lecture
2. Overhead
3. Slides
4. Film

The lighting control system is designed so that each pushbutton has a separate manual pre-set control panel behind it. These panels are located outside the auditorium in the dimming room, so that once carefully set up they do not need to be adjusted unless significant changes take place in the teaching functions. A lighting control system of this type has recently been installed in the Frank Dawson Adams Auditorium at McGill University and has been operating successfully for two semesters without any complaints of its operation.

## Performance Criteria Summary

Table 3 outlines a simplified collection of fourteen (14) different performance criteria, covering the range of seven (7) different technologies which make up the framework of auditorium facilities design for instruction.

In the last section of the paper we will try to show the relationship between these criteria, the design objectives and the work on audiovisual standards to date. The interaction of related technologies will also be shown.

## Testing Techniques

Testing techniques will be the subject of another paper, but Table 4 summarizes some simple instruments, test materials and references which can be used to obtain ballpark estimates of the parameters reviewed in Table 3. Two standard test slides for resolution and contrast are shown in Figures 10 and 11. Figure 12 matches with Figure 11 and enables a measurement of contrast ratio to be obtained under different lighting conditions.

## Auditorium Renovation Example

A short illustration of the difference that proper lighting design can make to an auditorium is shown in Figure 13 before renovation and Figure 14 after renovation of Frank Dawson Adams Auditorium at McGill. Note that the direction of the fluorescent lighting has been turned through 90 and properly distributed down lighting has been added under the lighting controls already described.

## Interaction of Related Technologies - Progress and Future Directions

To get some sense of direction out of this welter of design objectives and performance criteria, Figure 15 shows interaction of related technologies in the media project. The principal connecting links are between Architecture, A/V Technology and Lighting at the design stage. There are also direct links between layout which connects all the focal and operational points in the auditorium. Other direct links are between the acoustics and sound system design where there is a close relationship between acoustic design and sound system performance.

As we have just illustrated in the section entitled "Lighting Control and the Presentation Performance", lighting controls are also a vital part of the overall teaching facilities from the operating and image quality points of view.

That summarizes what has gone on in the past ten years or so in terms of establishing a framework of design objectives and performance criteria for auditorium facilities. What of the future?

It has been pointed out in a recent paper,[9] that there are direct links between the design procedures and standards activities which have also been going on for the past ten years or more. Figure 16 illustrates this relationship in connection with the projection/architecture design extracted from the paper.

The paper also points out that the standards activities have been confined to the area of equipment standards and that equipment standards could not be developed in isolation from the spaces and environments in which they are to be used. The paper proposes that further standards activities be started in two areas:

1. To establish categories of learning spaces
2. To establish matching categories of environment for projection, lighting, acoustics and human comfort.

At a recent meeting of the American National Standards Committee PH7 (which covers instructional A/V systems), a proposal was requested to cover the subject of "Audiovisual Environments for Learning Spaces." Some work in this area has already been completed separately by a committee of the British Standards Institution in a document entitled "Draft Standard Code of Practice for the Design of Learning Spaces for Audiovisual Equipment." The document has recently been issued for public comment.

It is anticipated that the American proposal will cover similar ground, but take a different approach in classifying the learning spaces and attempting to provide a matching technique between classification of the learning spaces, the audio-visual environments and the euqipment standards.

## Conclusions

The paper describes work which as been ongoing over the past ten years in developing design objectives and performance criteria for auditorium instructional facilities in the context of the individual technologies. Testing techniques and the interaction of related technologies in the media project were also summarized. The relationship to past and future standards activities was shown.

## Acknowledgements

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Acknowledgements are also due to Prof. Ray Wyman of the University of Massachusetts and the members of IEC Sub-Committee 60C for helpful discussions and support on the subject matter.

The contributions and encouragement of the Director and Staff of McGill University's Instructional Communications Centre, without whom none of the work would have been possible, are also gratefully acknowledged.

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9. Powell, A.J. "Audio Visual Environments and Equipment Standards for Education." JSMPTE no. 7, Vol. 92, July 1983, pp. 735.738.

"AUDITORIUM PERFORMANCE CRITERIA" - AMTEC/84 ART WORK

| DESIGNATION | TITLE | NOTES |
|---|---|---|
| Figure 1. | "Front Projection Geometry - Plan" | 1 - Photostat |
| Figure 2. | "Front Projection Geometry - Evaluation" | 1 - Photostat |
| Figure 3. | "Lighting Design Objectives" | 1 - Photostat |
| Table 1. | "Acceptable Noise Levels in Unoccupied Rooms" | 1 - Photostat |
| Figure 4. | "A, B & C Weighted Responses for Sound Pressure Level Meters" | 1 - Photostat |
| Figure 5. | "Range of Acceptable Reverberation Times at a Frequency of 500 HZ for Auditoriums of Various Sizes" | 1 - Photostat |
| Figure 6. | "Simplified Functional Diagram" | 1 - Photostat |
| Figure 7. | "Television vs A/V Projection Throws" | 1 - Photostat |
| Figure 8 a. | "FDAA Lecture Console" | 1 - Black & White Mounted Print |
| Figure 8 b. | "FDAA Lecture Console" | 1 - Black & White Print Mounted |
| Table 2. | "Image Contrast and Room Lighting" | 1 - Photostat |
| Figure 9. | "FDAA Lighting Control Panel" | 1 - Photostat |
| Table 3. | "Auditorium Performance Criteria" | 1 - Photostat |
| Table 4. | "Auditorium Testing Techniques" | 1 - Photostat |
| Figure 10. | "Testing Techniques SMPTE Resolution Test Slide" | 1 - Black & White Print Mounted |
| Figure 11. | "Testing Techniques Gray Scale Test Slide" | 1 - Black & White Print Mounted |
| Figure 12. | "Testing Techniques Photographic Density vs Contrast" | 1 - Photostat |
| Figure 13. | "FDAA Lighting & Seating After Renovation" | 1 - Black & White Print Mounted |
| Figure 15. | "Interaction of Related Technologies" | 1 - Photostat |
| Figure 16. | "Standards & the Projection/Architecture Design" | 1 - Photostat |

DETERMINATION OF SEATING AREA - A -( PLAN ). GEOMETRIC CONSTRUCTION BASED ON ARBITRARY CHOICE OF W & LIMITING VALUES OF b, $L_2$, $\alpha$

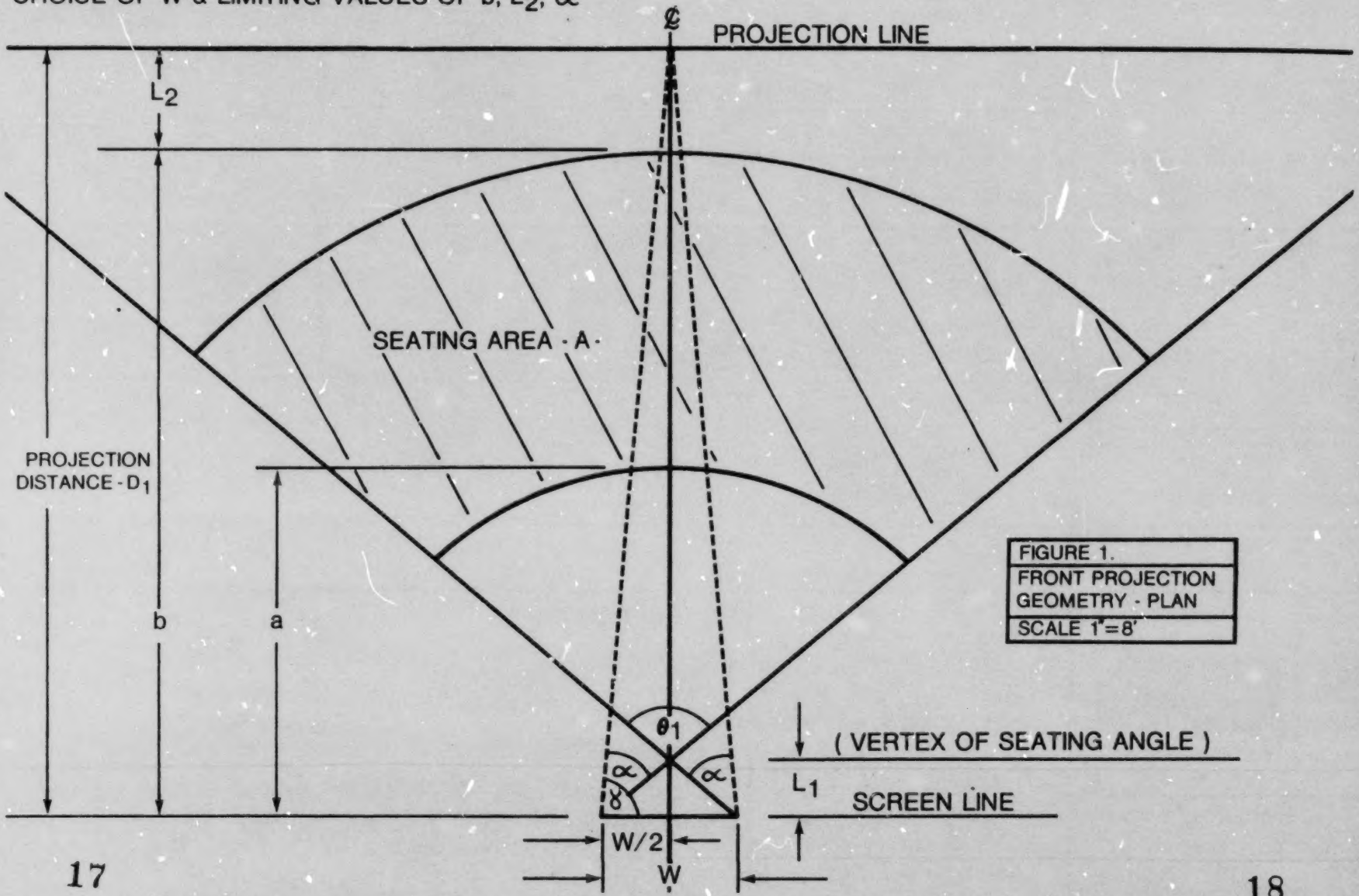
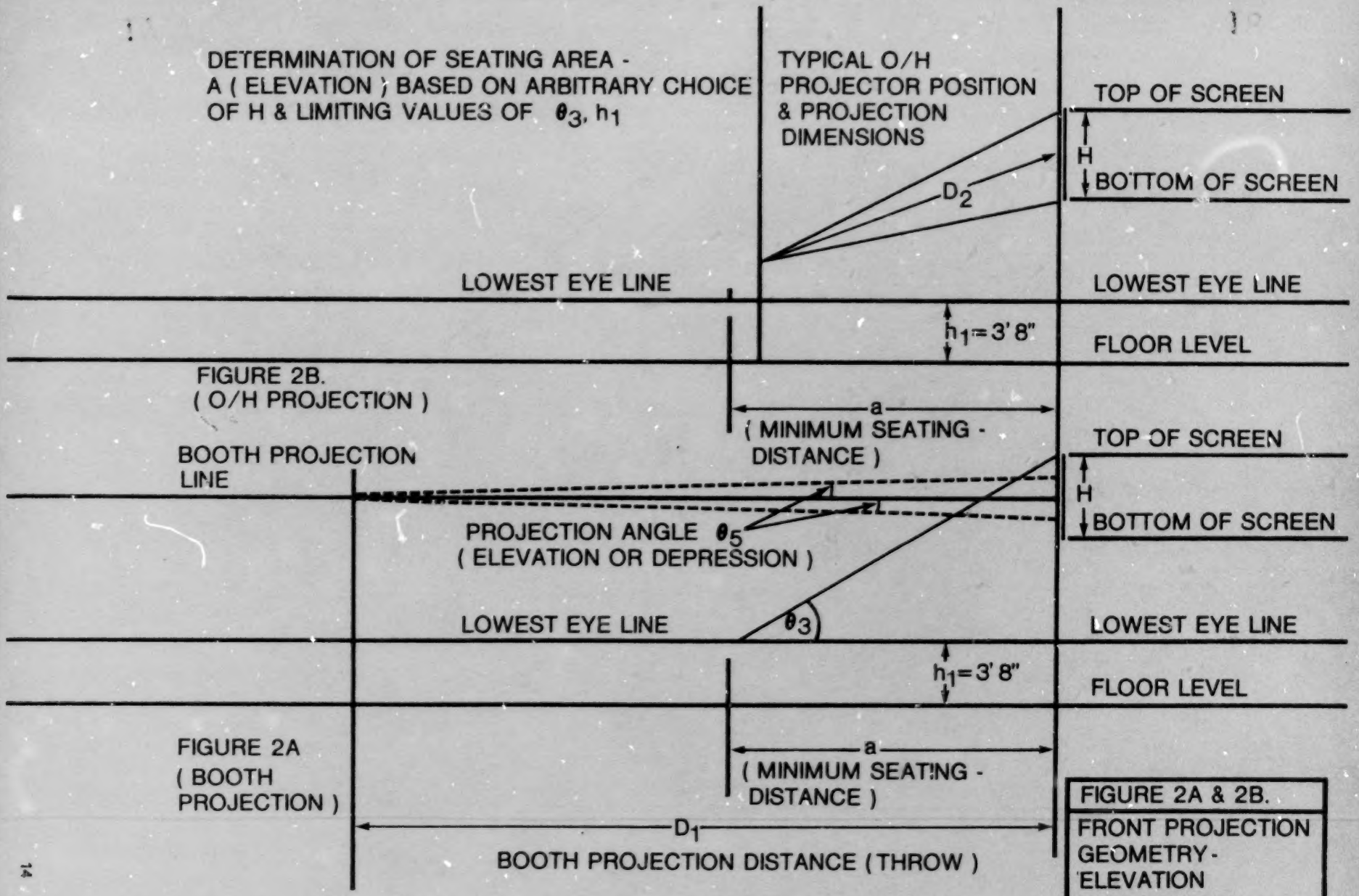



FIGURE 1.
FRONT PROJECTION GEOMETRY - PLAN
SCALE 1"=8'


DETERMINATION OF SEATING AREA -
A ( ELEVATION ) BASED ON ARBITRARY CHOICE
OF H & LIMITING VALUES OF $\theta_3$, $h_1$
TYPICAL O/H
PROJECTOR POSITION
& PROJECTION
DIMENSIONS
TOP OF SCREEN
H
BOTTOM OF SCREEN
$D_2$
LOWEST EYE LINE
LOWEST EYE LINE
$h_1$=3' 8"
FLOOR LEVEL
FIGURE 2B.
( O/H PROJECTION )
a
( MINIMUM SEATING -
DISTANCE )
TOP OF SCREEN
BOOTH PROJECTION
LINE
H
BOTTOM OF SCREEN
PROJECTION ANGLE $\theta_5$
( ELEVATION OR DEPRESSION )
LOWEST EYE LINE
$\theta_3$
LOWEST EYE LINE
$h_1$=3' 8"
FLOOR LEVEL
FIGURE 2A
( BOOTH
PROJECTION )
a
( MINIMUM SEATING -
DISTANCE )
$D_1$
BOOTH PROJECTION DISTANCE ( THROW )
FIGURE 2A & 2B.
FRONT PROJECTION
GEOMETRY -
ELEVATION
SCALE 1"=8'

**Establish Lighting Tasks**
PART I

Seat Lighting
-Chalkboard Lighting
-Control of Lighting
for Teaching Functions
-Lecture
-O/H
-Slides
-Film
-Provide Visual Comfort
for Note Taking in
All Functions
-Television Lighting

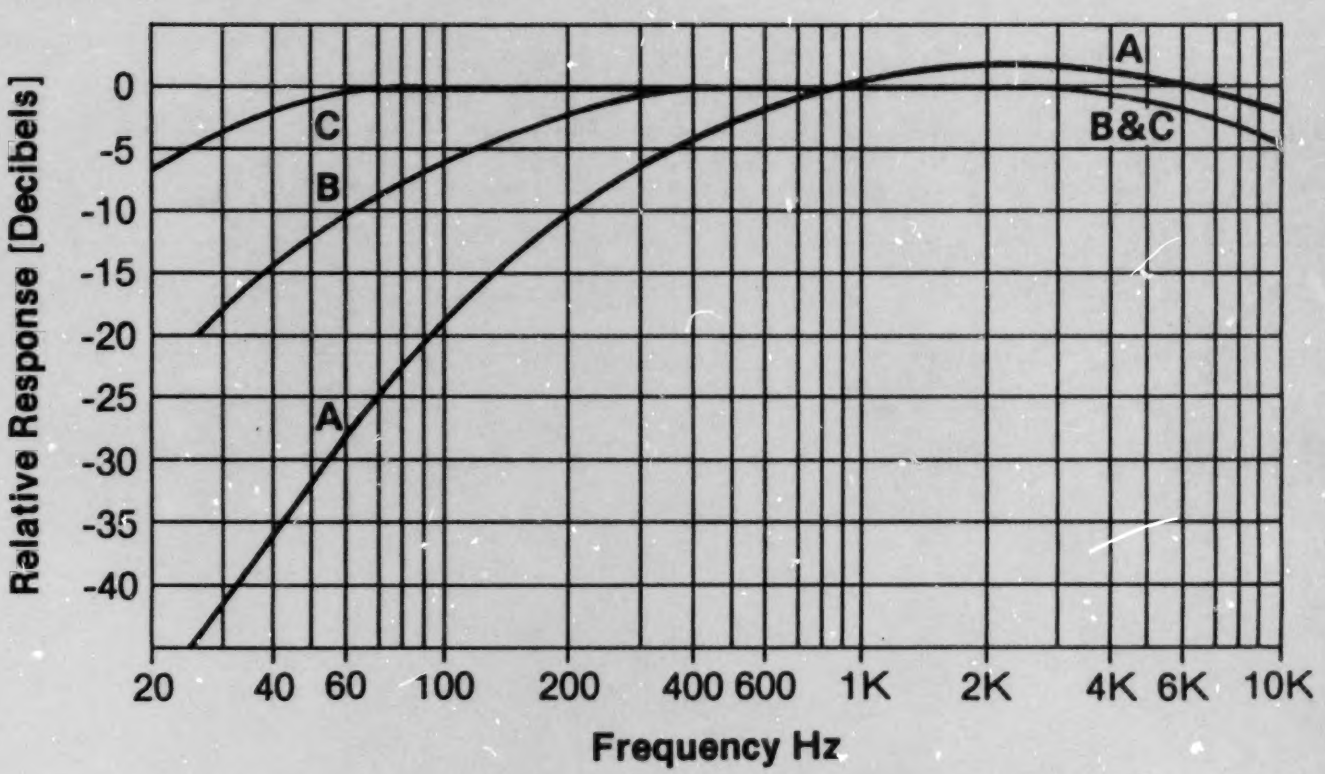
**DESIGN PROCESS**
PART II

-Build up of Lighting
for Different Tasks
-Design and Location
of Controls
-Misc Lighting
-Proj Booth
-Entrance Lights
-Step Lights
-Exit Signs
-Emergency Lighting

**LIGHTING DESIGN OBJECTIVES** FIG. 3

## ACCEPTABLE NOISE LEVELS IN UNOCCUPIED ROOMS

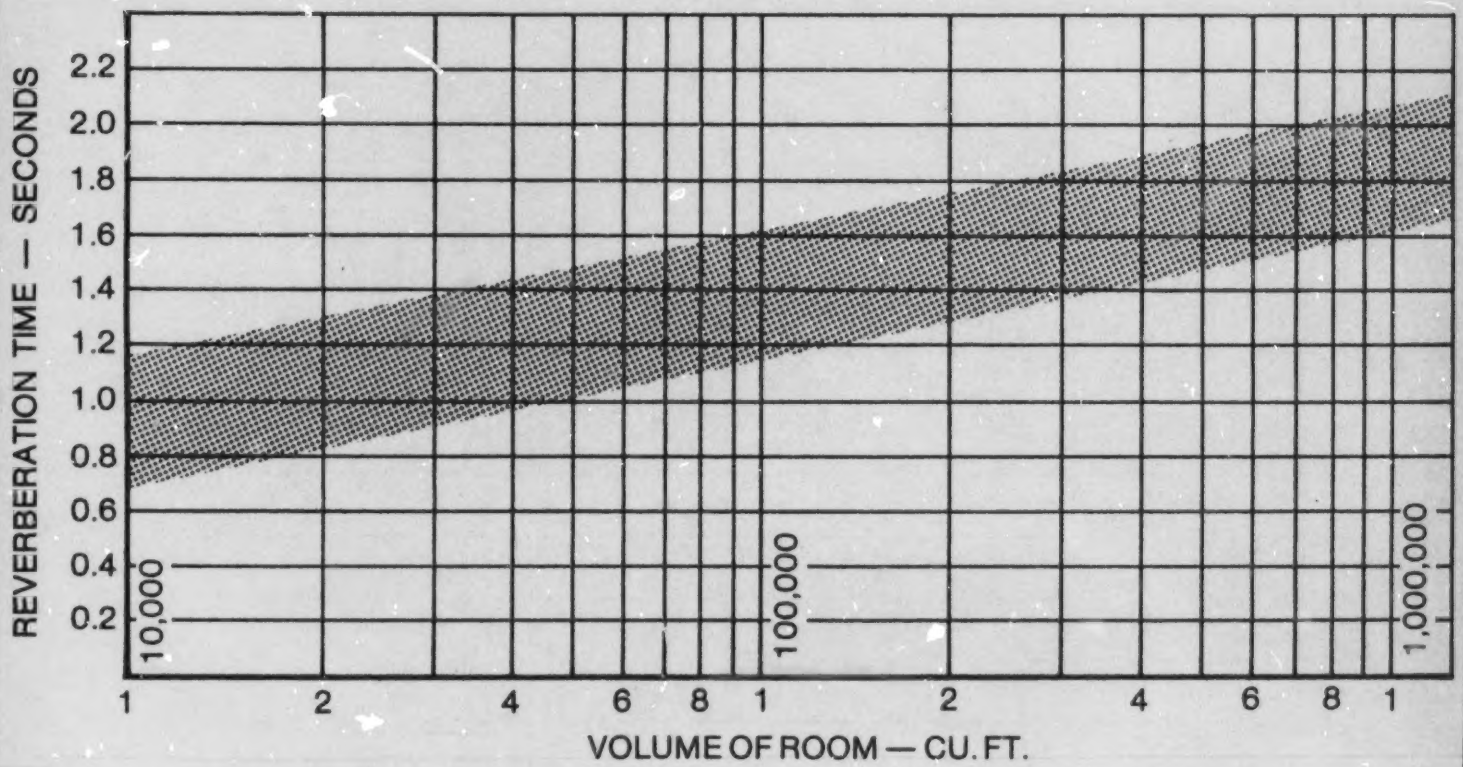
| Table 1 | db a | measured with SLM [a weighted] |
|---|---|---|
| Recording and TV Studios | 25-30 | |
| Theatres | 30-35 | |
| Motion Picture Screens and Auditoriums | 35-40 | |
| Classrooms & Lecture Rooms | 35-40 | |
| Conference Rooms and Small Offices | 40-45 | |
| Courtrooms | 40-45 | |
| Offices | 40-45 | |
| Libraries | 40-45 | |
| Restaurants | 50-55 | |

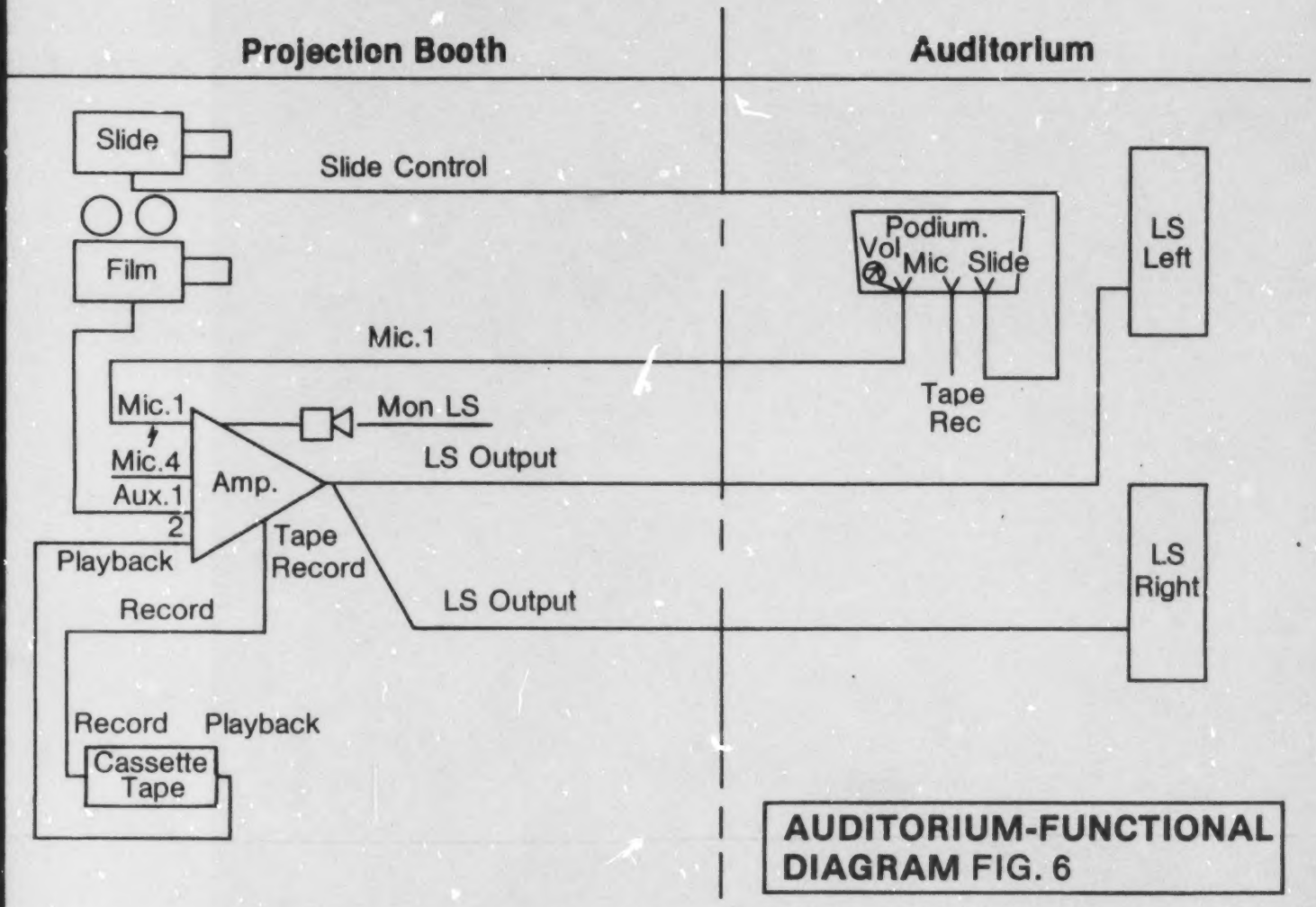



**A, B AND C WEIGHTED RESPONSES FOR SOUND LEVEL METERS (SLM)** FIG. 4

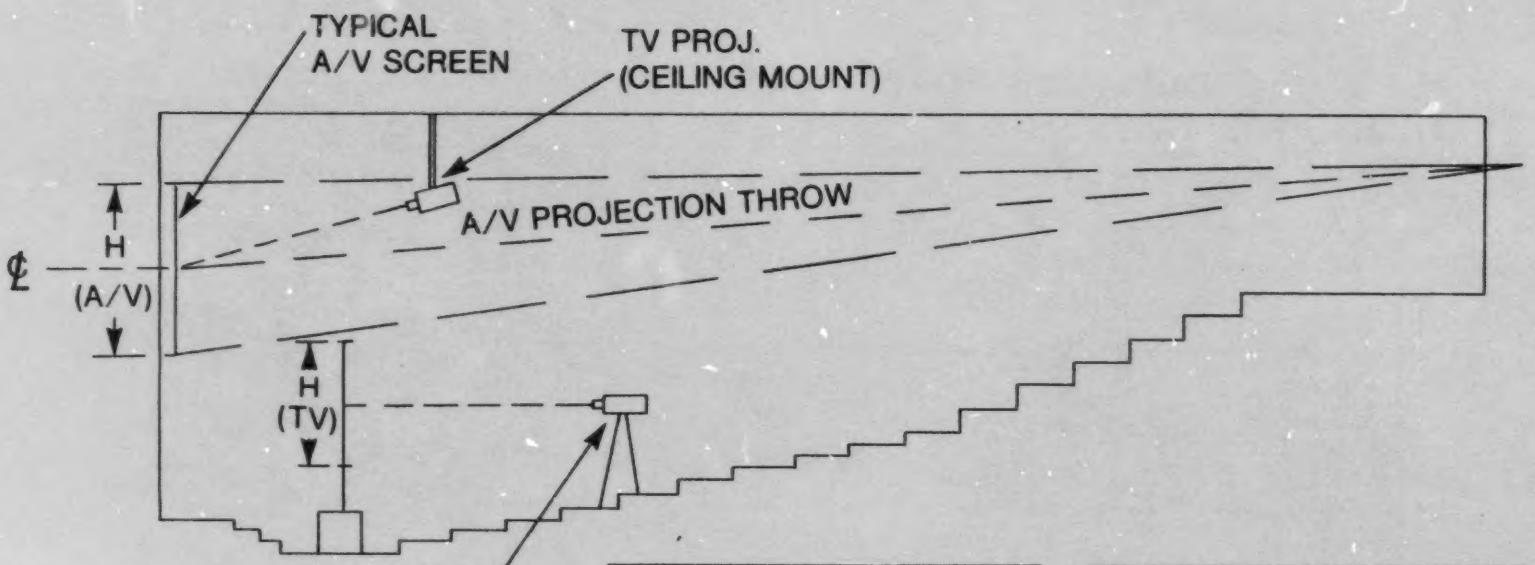
RANGE OF ACCEPTABLE REVERBERATION TIMES AT A FREQUENCY OF 500 CYCLES FOR AUDITORIUMS OF VARIOUS SIZES

FIG. 5






**AUDITORIUM-FUNCTIONAL DIAGRAM FIG. 6**




| TYPICAL A/V SCREEN |
| --- |
| H = 8'<br>W = 12' |

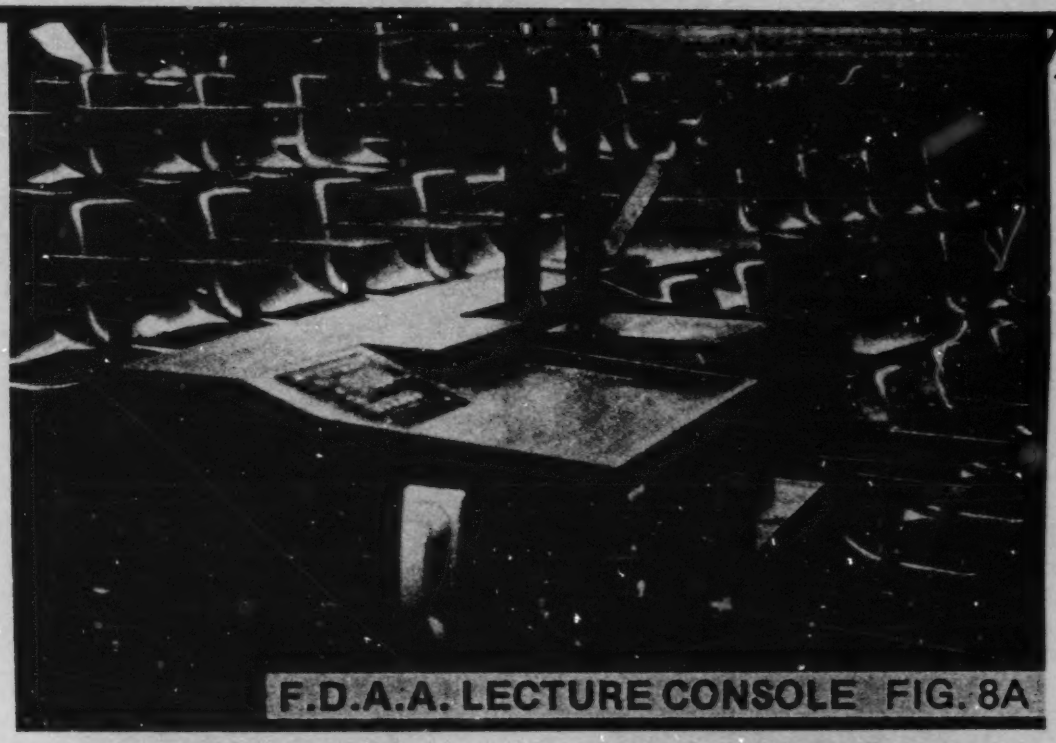
| TYPICAL TV IMAGE |
| --- |
| H = 6'<br>W = 8' |

TV PROJECTION = 1·5xW
THROW = 12'

TELEVISION vs A/V PROJECTION THROWS FIG. 7

SCALE 1/8" = 1" - 0"

# AMTEC '84 ...A Kaleidoscope of Media



F.D.A.A. LECTURE CONSOLE FIG. 8A

F.D.A.A. LECTURE CONSOLE FIG. 8B



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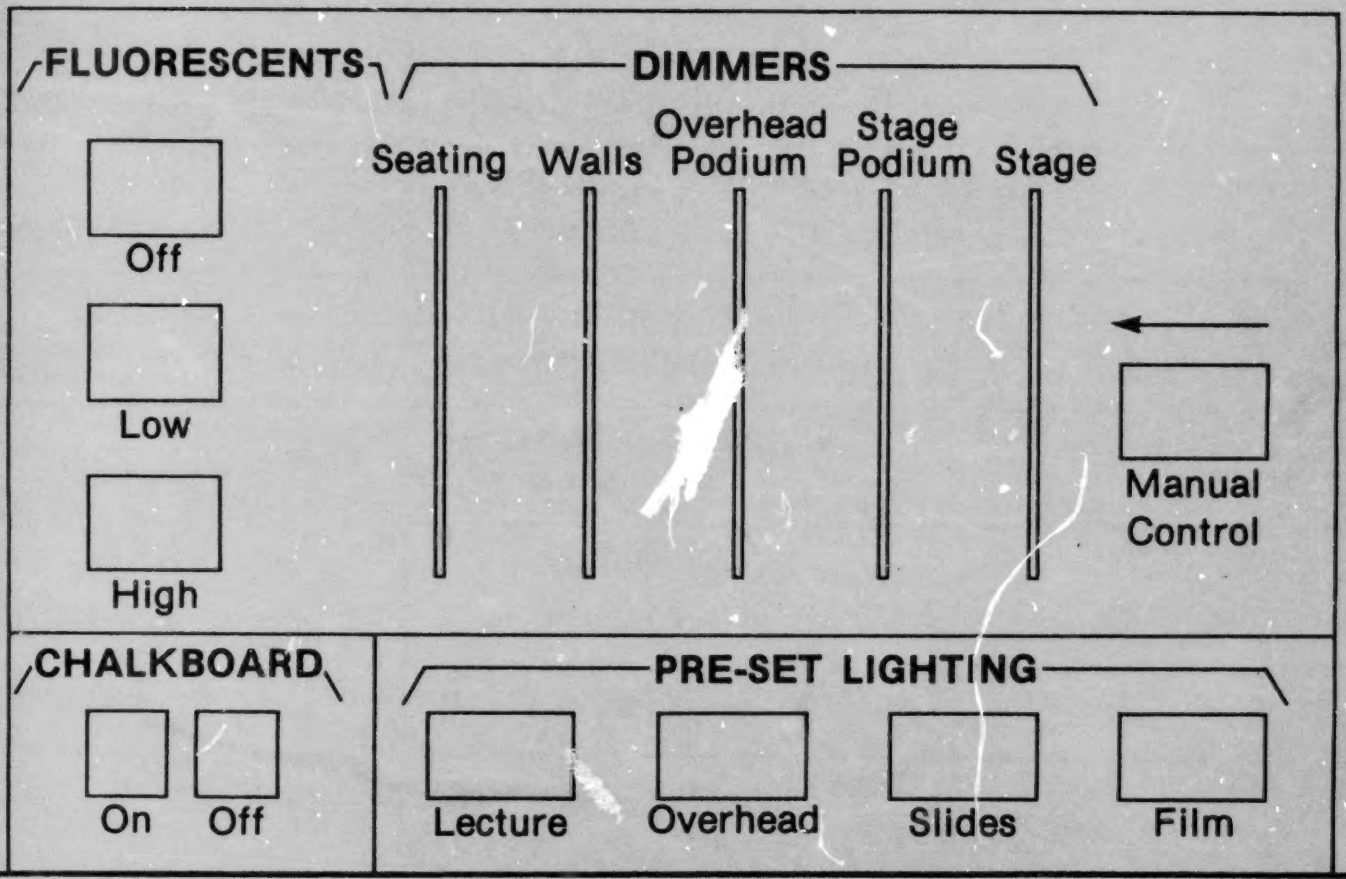
TABLE 2

# IMAGE CONTRAST & ROOM LIGHTING

| FORMAT | IMAGE DIMENSIONS | TYPICAL ROOM LIGHTING | TYPICAL NON IMAGE SCREEN BRIGHTNESS | SCREEN BRIGHTNESS OBJECTIVE ($B_S$) | REQUIRED PROJECTOR LIGHT OUTPUT(Lo) | CONTRAST |
|---|---|---|---|---|---|---|
| Overhead Transparencies<br>R = 1.20(horiz) | W = 8ft.<br>H = 6.66ft.<br>$A_I$ = 53.28ft² | 40ftC | 10ftL | 30ftL | Lo = $A_I$.Bs/Rs<br>Lo = $\frac{53.28 \times 30}{0.9}$<br>Lo = 1776 Lumens | 3:1 |
| 35mm Slides<br>R = 1.49 (horiz) | W = 8ft.<br>H = 5.37ft<br>$A_I$ = 42.96ft. | 5ftC | 0.5ftL | 16ftL | Lo = $\frac{42.96 \times 16}{0.9}$<br>Lo = 763.7 Lumens | 32:1 |
| 16mm Film (academy)<br>R = 1.338 | W = 8ft.<br>H = 5.98ft.<br>$A_I$ = 47.84ft² | 0.4ftC | 0.4ftL | 16ftL | Lo = $\frac{47.84 \times 16}{0.9}$<br>Lo = 850.5 Lumens | 40:1 |




**FDAA LIGHTING CONTROL PANEL** FIG. 9

## AUDITORIUM PERFORMANCE CRITERIA TABLE 3

| | |
|---|---|
| **1 Projection / 2 architecture** | 1-Viewing distance ratios<br>2-Viewing angles-Horizontal-vertical<br>3-Projection angles |
| **3 lighting** | 4-Lighting levels<br>5-Lighting distribution<br>6-Lighting control<br>7-Stray light |
| **4 Acoustics** | 8-Ambient noise<br>9-Reverberation time |
| **5 Sound Systems** | 10-Functional design<br>11-Intelligible transmission of speech |
| **6 Television** | 12-Viewing distance ratios (projection)<br>13-Lighting levels and color temperature (production) |
| **7 Auxiliary Systems** | 14-Human engineering of controls for simple operation (references) |

## AUDITORIUM TESTING TECHNIQUES TABLE 4

| | INSTRUMENTS AND PANELS |
|---|---|
| 1 Projection / 2 Architecture | - Rangefinder / Tape Distances / Image sizes<br>- Clinometer/Angles<br>- Resolution test slide Visible resolution |
| 3 Lighting | - Ft candle meter/Lighting levels<br>- Spot photometer/Stray light<br>- Gray scale test slide/Contrast |
| 4 Acoustics | - SPL meter/Ambient noise<br>- Pink noise generator Spectrum analyser/RT60 |
| 5 Sound Systems | - Pink noise generator Cassettes<br>- SPL meter/Sound levels |
| 6 Television | - Range finder and tape/Distance/Image sizes<br>- Ft candle meter-Color temperature meter |
| 7 Auxiliary Systems | - Human engineering charts<br>- Cardboard models of teaching consoles |

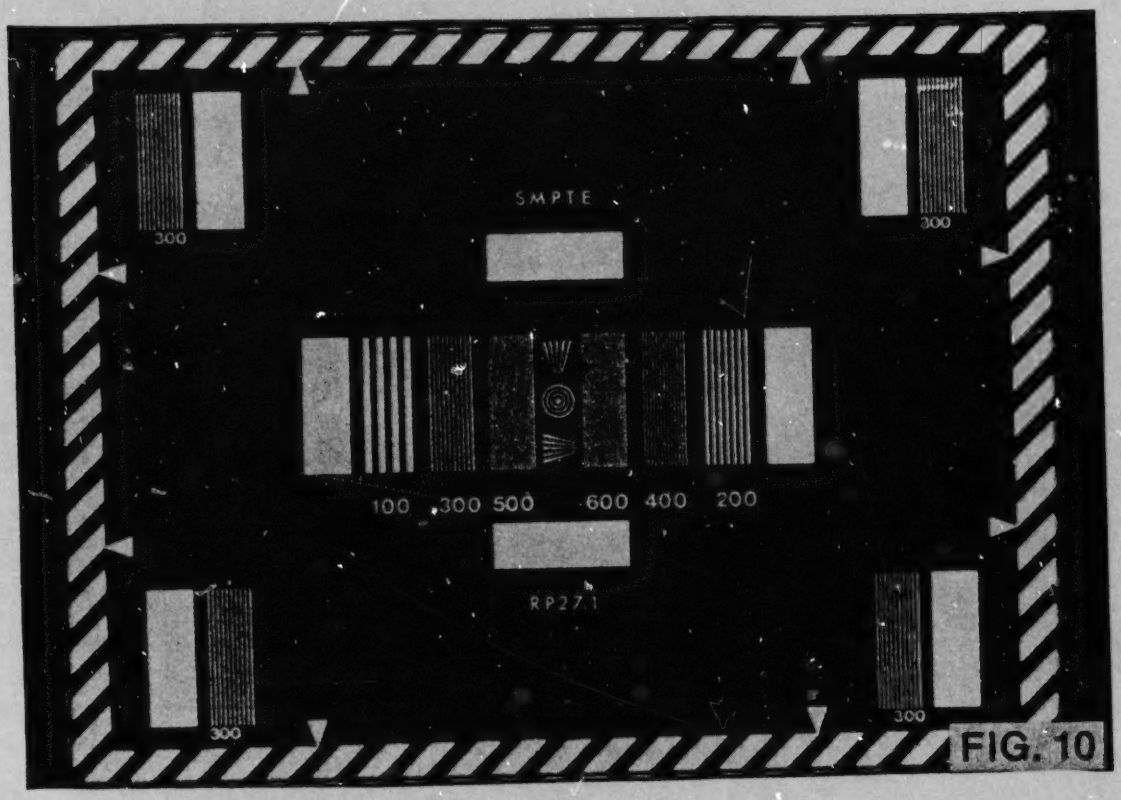



FIG. 10

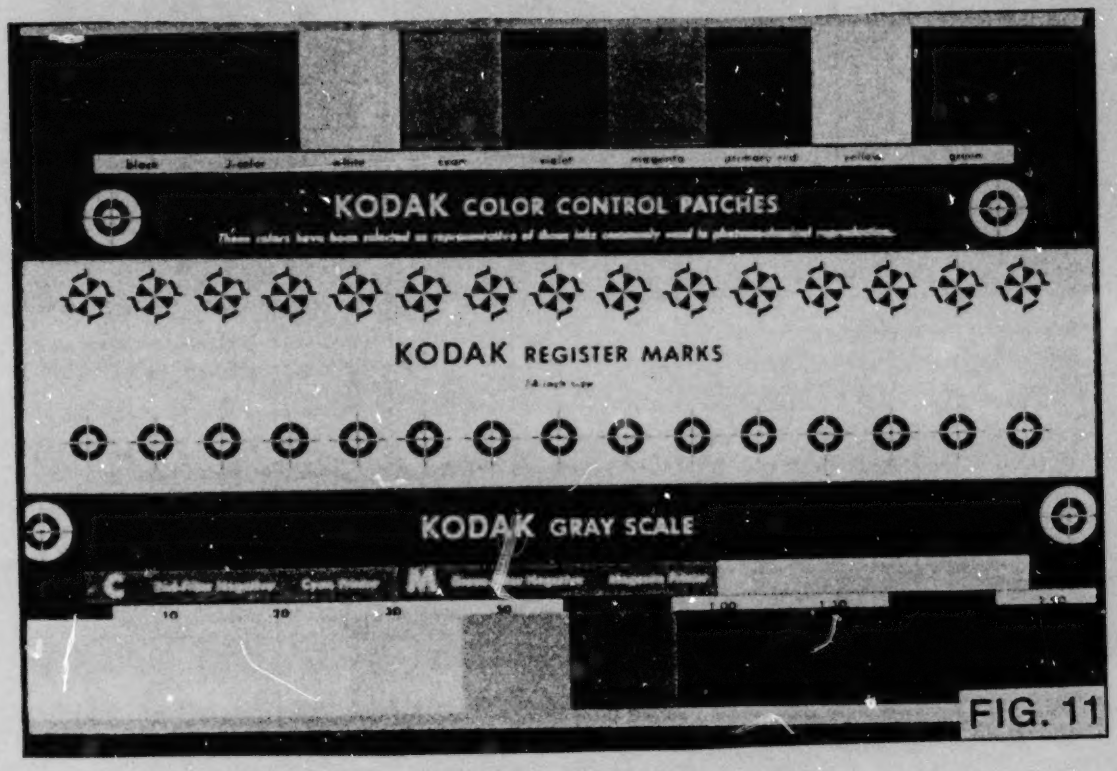



FIG. 11



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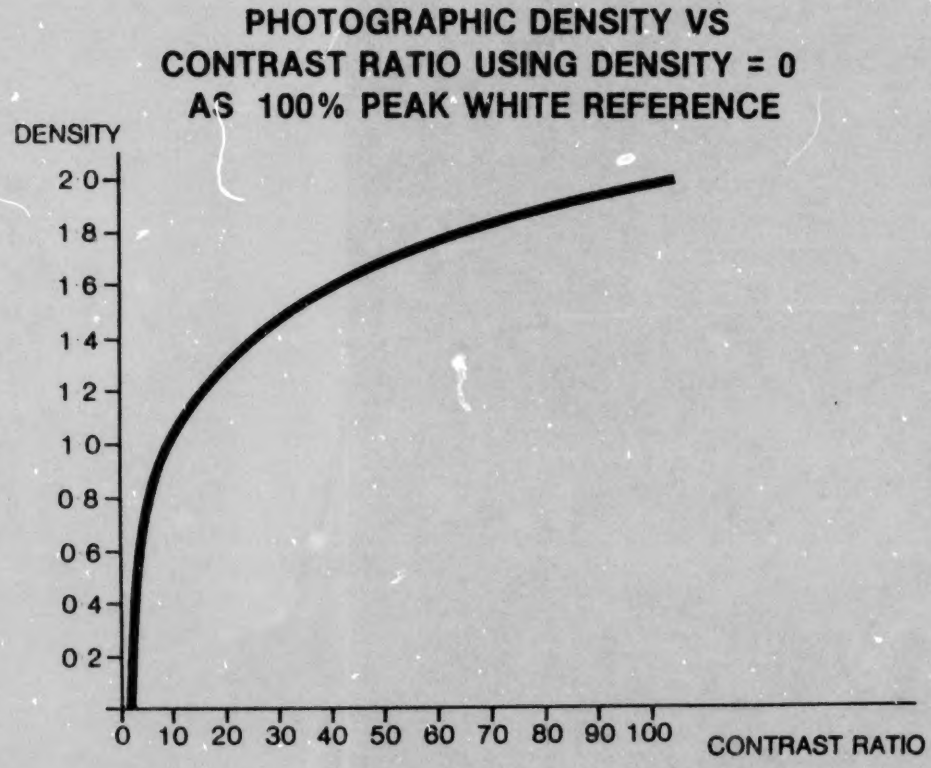
PHOTOGRAPHIC DENSITY VS
CONTRAST RATIO USING DENSITY = 0
AS 100% PEAK WHITE REFERENCE
DENSITY
2 0
1 8
1 6
1 4
1 2
1 0
0 8
0 6
0 4
0 2
0 10 20 30 40 50 60 70 80 90 100
CONTRAST RATIO

FIG.12

# AMTEC '84 ...A Kaleidoscope of Media

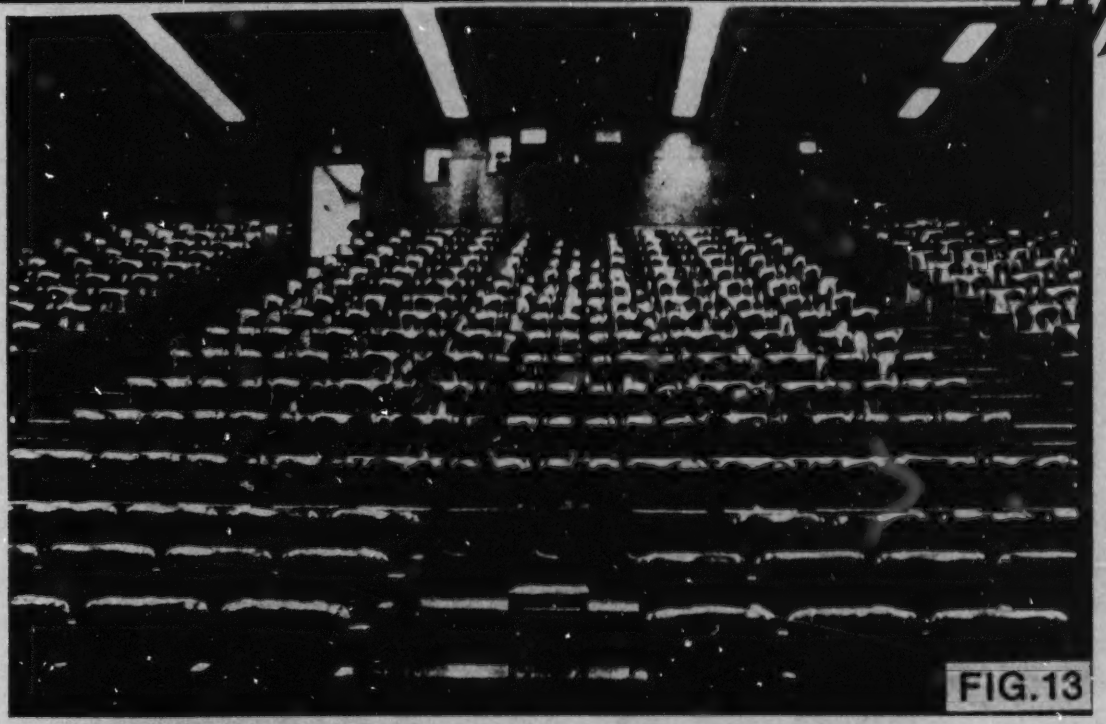

FIG.13

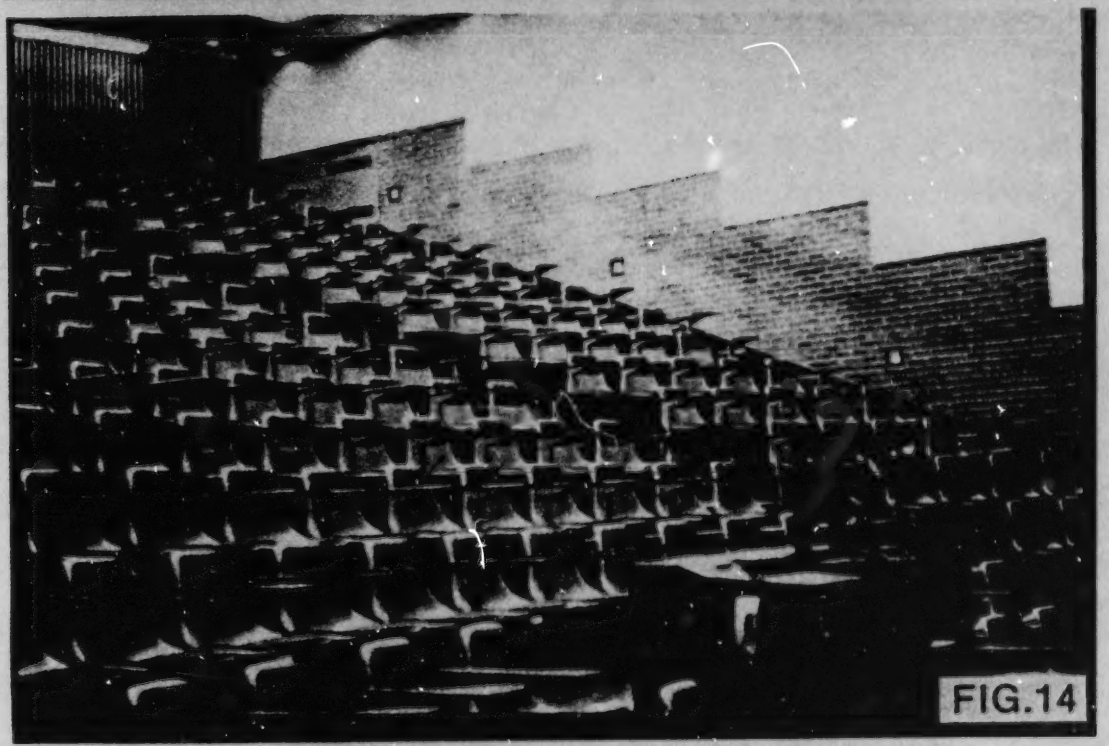

FIG.14



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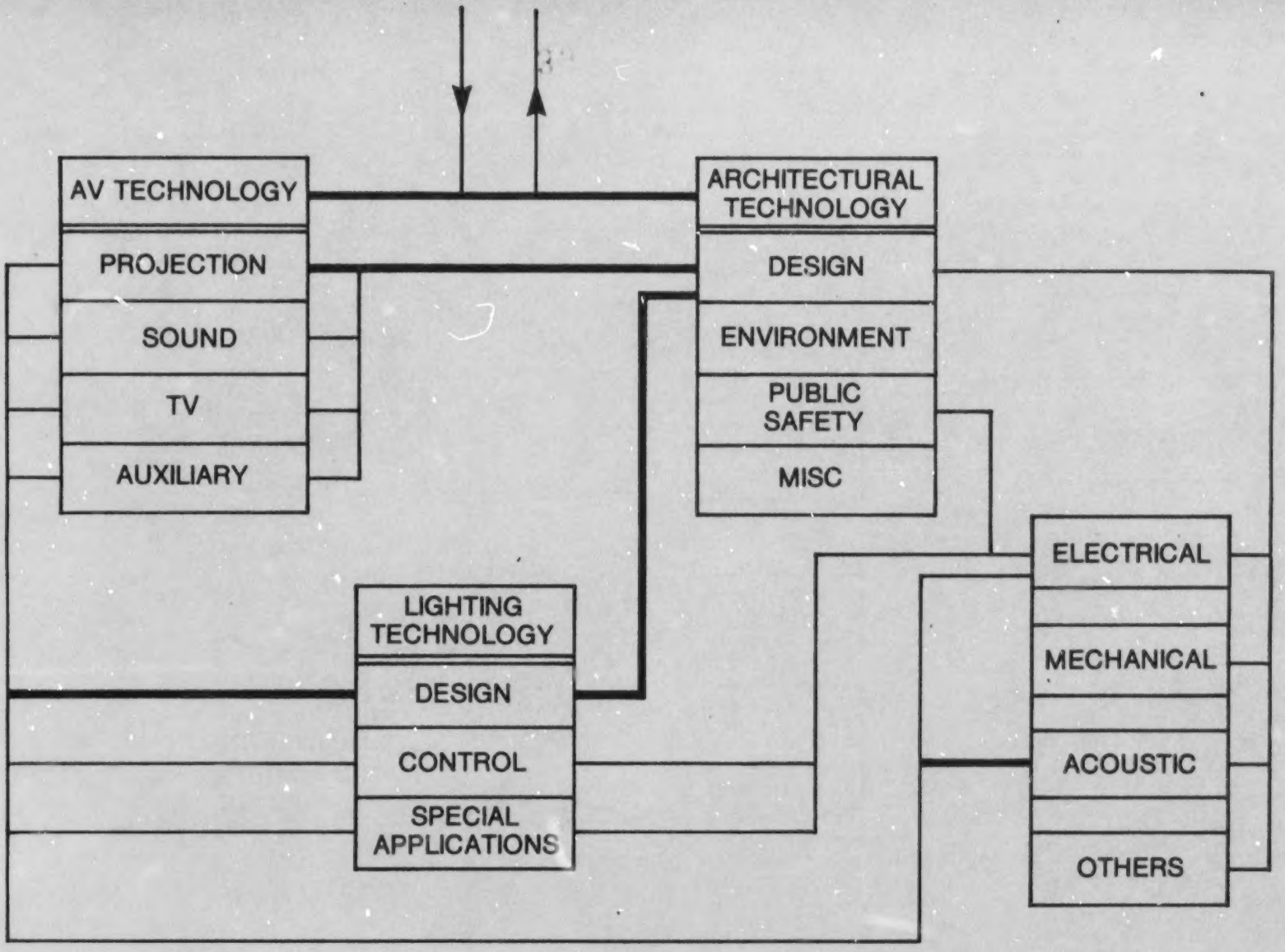


FIG. 15

THE MEDIA PROJECT — INTERACTION OF RELATED TECHNOLOGIES

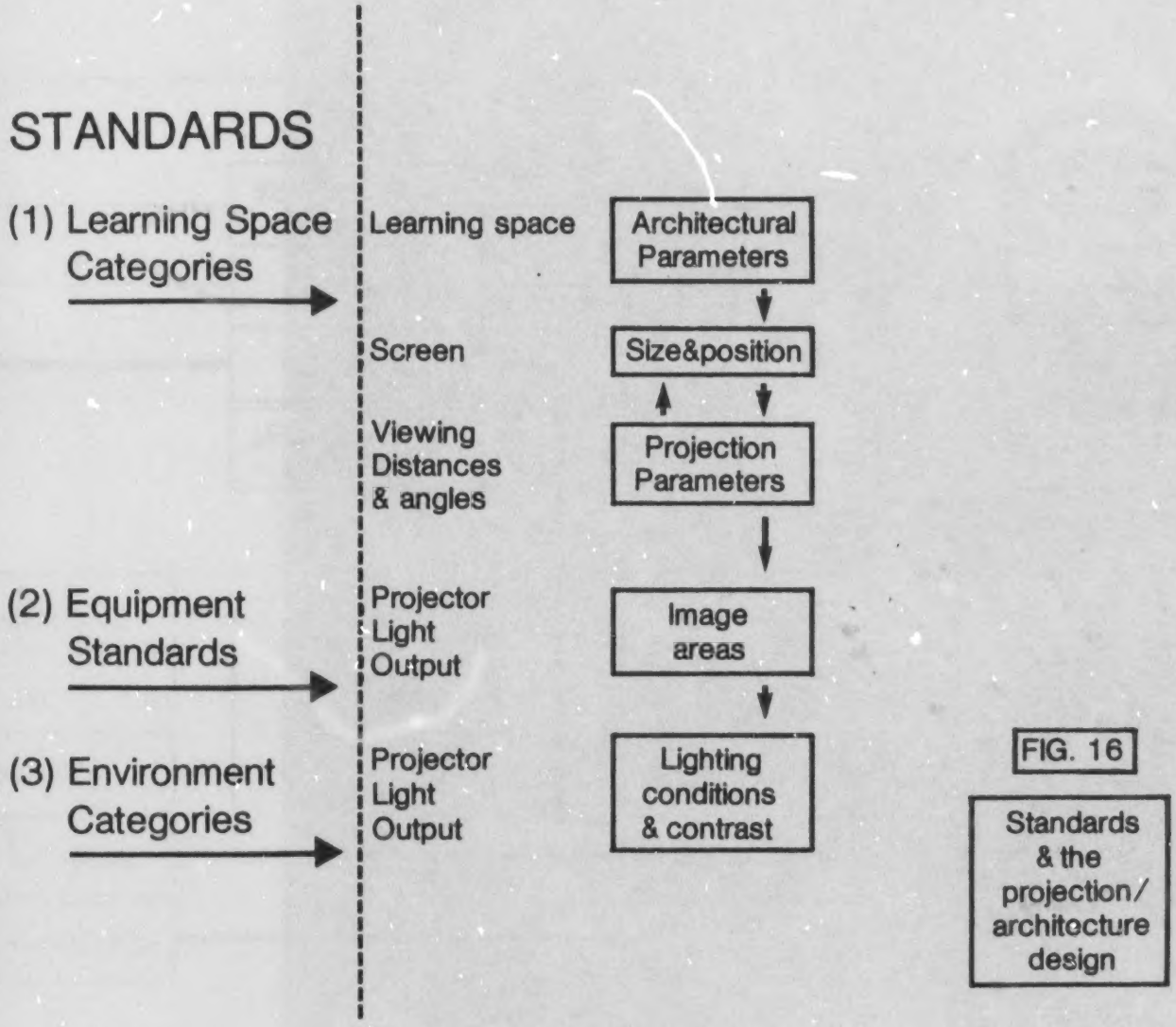


FIG. 16

Standards & the projection/ architecture design

# DO THE "COMPUTERS IN THE CLASSROOM" COURSES CHANGE TEACHERS TO DO A BETTER JOB IN THE CLASSROOM?

by Ray H. Topp, Associate Professor
The University of Western Ontario

In the summer of 1983, 250 teachers (170 Part 1, 80 Part 2) registered in the Additional Qualification Course, "Computers in the Classroom," offered by the Faculty of Education at The University of Western Ontario. A questionnaire was given to the students the first day and the last day of the course. The purpose of the survey was to gather data to assist in the planning of future courses. The following questions needed answers.

1. What teachers took the course?
2. Why did teachers take the course in microcomputers?
3. Did the course meet their objectives?
4. What concerns did the teachers have prior to the course?
5. What caused the most problems during the course for the teachers?
6. What changes, if any, occurred regarding teachers' knowledge, behaviour and attitudes toward using the microcomputer?
7. As a result of the above - what changes should be made?

## 1. WHAT TEACHERS TOOK THE COURSE

a) Level taught
- 70% taught elementary school
- 25% taught secondary school
- 5% classified themselves as administrators, principals, department heads, etc.

The same percentage held for both Part 1 and Part 2.

b) Teaching experience

| | | |
|---|---|---|
| - Part 1 | - 30% | 0 to 5 years |
| | 21% | 6 to 10 years |
| | 19% | 11 to 15 years |
| | 20% | 16 to 20 years |
| | 10% | over 20 years |
| - Part 2 | - 14% | 0 to 5 years |
| | 25% | 6 to 10 years |
| | 24% | 11 to 15 years |
| | 26% | 16 to 20 years |
| | 10% | over 20 years |

c) Sex

| | | |
|---|---|---|
| - Part 1 | - 60% | female |
| | 40% | male |
| - Part 2 | - 60% | male |
| | 40 | female |

d) Academic Qualifications

| | |
|---|---|
| - similar for both Part 1 and Part 2 | |
| 6% | without a B.A. degree |
| 80% | Bachelors degree |
| 14% | Masters degree |

e) Other Additional Qualifications Courses completed

| | |
|---|---|
| 25% | no other course |
| 20% | 6 or more |

f) Does the school have a microcomputer?

| | | |
|---|---|---|
| Yes | Part 1 | 63% |
| | Part 2 | 78% |

g) Do you have a microcomputer at home?

| | | |
|---|---|---|
| Yes | Part 1 | 19% |
| | Part 2 | 51% |



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2A. WHY DID YOU ENROLL IN THIS COURSE? Pre-Survey

More than one response was stated by some teachers, therefore the totals will be over 100%

PART 1 responses

| | | |
|---|---|---|
| a) | 50% | To increase my knowledge of microcomputers |
| b) | 38% | To learn how to relate the micro to the classroom to help children learn. |
| c) | 13% | I have a personal interest in microcomputers |
| d) | 13% | Male Teachers only - to increasy my qualifications - to get a certificate - for job security |
| e) | 7% | The School is getting a microcomputer |

PART 2 responses

| | | |
|---|---|---|
| a) | 58% | To increasy my knowledge of microcomputers |
| b) | 42% | Female teachers only - to increase my skill in programming. |
| c) | 31% | To learn how to relate the micro to the classroom |
| d) | 30% | I have a personal interest in microcomputers |
| e) | 30% | Male teachers only - to increasy my qualifications and salary - to get a certificate - for job security |
| f) | 16% | Female teachers only - to be the microcomputer resource teacher in school. |

2B. WHAT MAJOR OBJECTIVES DO YOU HOPE TO ACHIEVE? Pre-Survey

More than one response was made by many teachers therefore the total well be over 100%.

PART 1 responses

| | | |
|---|---|---|
| a) | 51% | To gain more competency in programming. |
| b) | 33% | To learn how to use a micro in the classroom. |
| c) | 12% | To be able to adapt programs to meet the school curriculum. |
| d) | 10% | To be able to teach programming. |
| e) | 7% | To become more aware of the different types of software. |

3. DID THE COURSE MEET YOUR OBJECTIVES? WHY? (Post Survey)

a) 41%, Yes, I gained more knowledge and became more computer literate.
b) 15% Yes, I now feel more comfortable and confident and less intimidated in using the microcomputer.
c) 10% Yes, I learned how to use the micro in the classroom.
d) 30% Yes, no comment.

PART 2 responses

a) 58% Yes, I increased my knowledge of computer programming.
b) 10% Yes, I am now better able to evaluate software programs.
c) 30% Yes, no comment.

4. WHAT MAJOR CONCERNS DO YOU HAVE ABOUT TAKING THIS COURSE? Pre-survey

Many teachers did not respond or had no concerns.

PART 1 and 2

| | | |
|---|---|---|
| a) | 14 % | Will there be enough time to complete all the assignments? |
| b) | 10% | Will it be too technical and will the programming be beyond my capabilities? |
| c) | 10% | Do I have the ability to keep us? |
| d) | 7% | Part 1 teachers - I have no background knowledge to refer to if necessary. |
| e) | 7% | Will the information be applicable to the classroom? |

5. WHAT CAUSED YOU THE MOST CONCERNS OR ANXIETY DURING THE COURSE?

PART 1 responses

| | | |
|---|---|---|
| a) | 35% | The programming assignments |
| b) | 13% | Time to get the work done and work on the micro. |
| c) | 12% | The seminar presentation to peers. |
| d) | 40% | no comment or no concerns. |



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PART 2 responses

a) 31% Time to complete the assignments.
b) 21% Programming.
c) 14% The programming assignments.
d) 10% Writing the essay.
e) 24% no comment or no concerns.

6. The next part of the survey was to find out if only change took place in teachers' knowledge, behaviour or attitudes over the four week period.
Three instruments were used:
a) a self assessment scale,
b) a test
c) a questionnaire
All were administered the first and last day of the course. The instruments were used with both Part 1 and Part 2 students.

(1) First the teachers were asked to evaluate their own level of knowledge or skill, using a 4 point scale from one (low) to four (excellent) on thirteen items ranging from the history of micros to utilization of computer learning materials.

| | Pre Survey | Post Survey |
|---|---|---|
| Part 1 mean | 1.47 | 3.04 |
| Part 2 mean | 2.74 | 3.24 |

Teachers indicated they made the highest gains in their knowledge and skill on how to load, save and list programs and the lowest gains in the history of micros, writing and altering programs and the utilization of computer learning materials.

Second, teachers were asked to indicate their level on a continuum from no awareness to developing integrated curriculum materials that use the microcomputers.

| PART 1 | Pre Survey | Post Survey |
|---|---|---|
| Awareness but no experience | 58% | 0% |
| Increasing my basic knowledge | 33% | 70% |
| Able to guide student use of micro | 6% | 18% |
| Capable of developing integrated materials | 0% | 12% |
| **PART 2** | | |
| Awareness but no experience | 0% | 0% |
| Increasing my basic knowledge | 79% | 24% |
| Able to guide student use of micro | 14% | 35% |
| Capable of developing integrated materials | 7% | 41% |

(2) A twenty item multiple choice test was administered.

| | Pre Course | Post Course |
|---|---|---|
| Part 1 mean | 42% | 68% |
| Part 2 mean | 69% | 76% |

PART 1

The greatest change in score was related to terminology and the meaning of terms such as byte, C.P.U., save, logo, machine language, tutorials and modems.

The least change in scores was related to history and the new developments of micros.

PART 2

The highest scores on the pre-test and post-test were related to the areas of greatest change in Part 1 and the lowest scores to the same areas of least change inf Part 1. (history, etc.)



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(3) The teachers were asked if and how they planned to use the microcomputer during the next school year.

| | Pre Survey | Post Survey |
|---|---|---|
| PART 1 | | |
| Do you plan to use the micro during the next school year? | 91% yes | 90% yes |
| PART 2 | 93% yes | 100% yes |

If yes, how?

| PART 1 | Pre Survey | Post Survey |
|---|---|---|
| a) Left blank (I don't know) | 40% | 30% |
| b) To teach programming and computer literacy | 0% | 24% |
| c) For drill and practice activities | 20% | 18% |
| d) For administrative purposes - record keeping of marks | 11% | 8% |
| e) For remedial activities | 6% | 5% |
| f) For enrichment activities | 8% | 4% |
| g) For C.A.I. activities | 4% | 4% |
| h) For instruction of curriculum e.g. Math and Language | 8% | 2% |
| **PART 2** | | |
| a) To teach programming and computer literacy | 11% | 27% |
| b) Left blank (I don't know) | 38% | 21% |
| c) For drill and practice activities | 11% | 16% |
| d) For C.A.I. activities | 6% | 16% |
| e) With the "Computer Club" | 5% | 9% |
| f) For instruction of curriculum e.g. Math, Language, Science | 15% | 5% |
| g) For administrative purposes record keeping | 12% | 5% |

Do you see the role of teachers changing as the micro becomes more widespread in the schools?

| PART 1 | Pre Survey | Post Survey |
|---|---|---|
| | Yes 76% | Yes 88% |
| | No 24% | No 12% |
| PART 2 | | |
| | Yes 76% | Yes 78% |
| | No 24% | No 22% |

If yes, how do you see the teachers role changing? (Post survey)

PART 1 and 2 combined

| | | |
|---|---|---|
| a) | 32% | The teacher will become more a facilitator, a guide, an advisor, or a motivator and less as a dispenser of knowledge. |
| b) | 13% | The teacher will now be able to devote more time to individualized instruction. |
| c) | 7% | The teacher will now spend less time on administrative tasks, drill and marking activities, and more time on teaching. |
| d) | 5% | The teachers will become learners along with their students. |
| e) | 15% | The Teacher's role will not change. Teachers will still be needed to motivate, encourage and guide student learning, but they will need to learn to use the micro like any other tool in the classroom. |
| f) | 28% | Left blank. |



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What do you see as the greatest dilemma facing educators in using the microcomputers?

| | | Pre Survey | Post Survey |
|---|---|---|---|
| PART 1 | | | |
| a) | Operation of machines | 15% | 5% |
| b) | Cost of equipment | 11% | 19% |
| c) | Lack of standards in courseware | 27% | 42% |
| d) | Rapid development of technology | 45% | 31% |
| PART 2 | | | |
| a) | Operation of machines | 5% | 4% |
| b) | Cost of equipment | 16% | 8% |
| c) | Lack of standards in courseware | 56% | 67% |
| d) | Rapid development of technology | 22% | 19% |

Do you feel competent in helping others develop computer literacy?

| | Pre Survey | Post Survey |
|---|---|---|
| PART 1 | Yes 22%<br>No 76% | Yes 79%<br>No 20% |
| PART 2 | Yes 73%<br>No 25% | Yes 93%<br>No 6% |

What do you think are the major obstacles in developing computer literacy with students? (More than one response given by some teachers, therefore total will be more than 100%)

PART 1 and 2 combined - Post Survey

| | | |
|---|---|---|
| a) | 60% | The lack of hardware (microcomputers etc.) |
| b) | 24% | The lack of good quality software |
| c) | 23% | The lack of knowledgeable, qualified, adquately trained teachers. |
| d) | 14% | The negative, apathetic or fearful attitude of teachers toward computers. |
| e) | 9% | Time to teach computer literacy in an already overcrowded curriculum. |
| f) | 7% | Teachers now knowing how to meet the varied levels of computer literate students especially when the students know more than the teachers! |

## 7. WHAT DID THE SURVEY TELL US?

The survey indicates that the majority of teachers taking the "Computers in the Classroom" courses for credit are less than 40 years old and teaching in the elementary schools. Most have a bachelors degree while 14% have a masters degree. There is a great diversity of experience although the courses in computers were the first taken by over 25% of the people. How do we educate the teacher over forty years of age?

When asked why they took the course, teachers seemed to put more emphasis on self and personal knowledge rather than on others and strategies for others, that previous surveys of additional qualifications courses indicated.

Over 30% of the teachers in both Part 1 and 2 stated that their objective was to learn how to relate the microcomputer to the classroom to help children learn but only 10% made reference to this after the course as to meeting their objective.

The Part 2 teachers wanted more emphasis on programming than those in Part 1 and indicated that the course met their objectives. Is this because over half of the Part 2 teachers had their own micros at home?

Prior to the course, teachers expressed more concerns with time and their own abilities rather than if the information was applicable to the classroom. After the cours, teachers indicated that the programming assignments caused them the most concern during the course.

The pre survey and post survey responses indicate areas of both great and little change in knowledge behaviour and attitudes. The correlation between the test results and the teachers evaluation of their own levels showed that they can accurately judge the areas where they have made the greatest and least gains. Teachers seems to be able to evaluate themselves well. Teachers made good growth in their basic knowledge, awareness and ability to guide student use of microcomputers and little growth in history and new developments of the micro.



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One of the most significant changes was in the planned future use of the micro in the classroom. More teachers planned to teach programming after the course than before and fewer teachers planned to use the microcomputer for instruction of curriculum after the course than before.

After the course a large number of teachers in both Part 1 (30%) and Part 2 (27%) did not complete how they planned to use the micro during the next school year. Does this mean they still don't know how to use the microcomputer?

A big change was that the teachers certainly flet more competent after the course than before. Many teachers changed their opinions regarding the future dilemma facing educators. The emphasis seemed to switch from hardward to software.

WHAT CHANGES SHOULD BE MADE IN TEACHER EDUCATION COURSES?

The 125 hour additional qualifications courses meet the needs and objectives of many teachers and the courses do change teachers' knowledge, behaviour and attitudes to do a better job in the classroom. As teacher training courses, more emphasis should be on storyboard production, evaluation, adaptation and utilization of new existing programs and less on programming in the basic language. Teachers that wish to learn more about programming in order to write programs themselves should take courses from other educational institutions or learn it as an option in the course using a computer assisted learning module. Teachers should combine their new knowledge of computers with pedagogy to develop new programs with the assistance of a programmer. In this way better and more software will develop.

Other non-credit, ten hour courses whould be made available by facilities of education which might attract more secondary teachers, older teachers and administrators. Such short courses could stress general topics such as "Teaching with a Computer", "Logo", "Word Processing", or be subject specific to Mathematics, Science, Language, etc.

Readers of this paper may come to additional conclusions than this researcher. The data collected came from teachers taking courses from The University of Western Ontario in south western Ontario and may or may not be similar to data from courses offered by other universities.

Comments from interested parties would be welcome.

## THE STATE OF THE ART IN THE USE OF MICROCOMPUTERS IN ELEMENTARY EDUCATION 1984

by Ray H. Topp

During my academic development leave from the Faculty of Education, The University of Western Ontario, 1983-84, I have had the opportunity to visit various school districts in the United States, Canada, New Zealand and Australia to observe first hand how microcomputers are being used in elementary school. I have talked with many teacher of regular and special classes, from kindergarten to Grade eight who are using microcomputers and I have observed hundreds of children using different hardware and software. I have discussed school policy with principals and board policies with computer consultants and superintendents. I have visited different Faculties and Colleges of Education, discussed curriculum and observed courses being taught to teachers at the pre-service and in-service level. The following is a report of my observations on the present use of micros in the schools, my predictions for future developments and some recommendations regarding hardware, software, use of microcomputers and teacher training.

### A. HARDWARE

There exists a variety in the number and kinds of microcomputers in elementary schools throughout the world. Some elementary schools do not have a micro but many seem to have one or two with a "green" monitor and an accompanying tape drive. Some schools in each board or district are equipped with four to ten micros, colour monitors, disk drives and printers. This difference in hardware seems to be because the teachers and/or principals of the school have become interested in micros and have earned the money to purchase more equipment through various school fund raising schemes or have persuaded businesses or service clubs to donate them. In the United States some Chapter 1 or Chapter 2 Funds (grants for improving education in disadvantaged schools) are sometimes used to purchase hardware. Similar grants made to disadvantaged schools in Australia may be used with school-raised funds to help obtain equipment. Grants by the Government of Ontario allows schools to purchase the "Icon" at reduced prices. However the lack of government funds does not stop resourceful teachers from getting microcomputers. The interest, support and leadership of the principal, or lack of it, if often the most contributing factor to the number of micros and peripherals available in each school.



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# AMTEC '84 ... A Kaleidoscope of Media

Accoding to a report released in June by Alberta's task force in the use of computers in education, over 20,000 microcomputers were in Canadian schools as of April 1, 1983. Industry insiders update that figure to approximately 26,000 by November as school boards in all provinces are taking delivery of increasing numbers of micros. Ontario leads the way with over 10,000, followed by Alberta with over 4,000, British Columbia with over 3,500, Manitoba with 2,000 and Saskatchewan with 2,000.

In the United States the number of schools using microcomputers doubled in 1983 according to Market Data Retrieval Inc. About two thirds of the elementary school in the U.S. and three quarters of the junior schools (Grade 7 to 9) use at least one microcomputer in instruction. Currently U.S. schools own an estimated 325,000 microcomputers nationwide.

In Minnesota, California, and Australia, I visited a few elementary schools with mini-labs of ten micros to full labs with twenty-five complete with large monitor, tape drives and printers. A few other schools had a micro and tape drive in every classroom.

Some boards or districts of education have established a policy of recommending the purchase of only one type of microcomputer (Apple, Commodore, Radio Shack, BBC, etc.). Other boards or districts approve three or four different machines that meet the expected requirements and leave it to the individual schools to select the desired type and model. Some provinces, states or countries have or are in the process of developing a machine to meet their own specifications. For example the "Icon" in Ontario, the "Micro Bee" in New South Wales and the "Poly" in New Zealand. Presently there exists a variety of models of micros in different schools or even within the same school. However the Apple II seems to be the most dominant microcouputer outside Southern Ontario.

It seems that once a school has two or three micros the principal and teachers begin to look at peripheral attachments. Many schools have established in-house computer advisory committees to recommend the purchase of equipment such as disk drives and printers or new software packages. Some schools have recognized the need for suitable desks and chairs for using the microcomputer and have purchased, or more often built, tables that hold the keyboards and the monitor at the right height for student use. (Audiovisual carts are unsuitable).

Many school boards or districts have established one or more microcomputer labs with twenty-five micros, usually in a secondary school, or a computer resource center in order to teach computer literacy courses. Often these machines are moved to other schools for sessions with students and teachers. A district in Hawaii has a portable lab that moves from school to school to teach computer literacy to students and teachers.

Some prediction for the next two or three years:

(a) There will be a large increase in the number of microcomputers in elementary school with a small increase in secondary school. A few elementary school plan to have a micro in every classroom within a year and others within two or three years. Talmis, a Chicago-based research firm, predicts that by 1988 there will be two million microcomputers in public schools, with an average of twenty per school.

(b) Colour monitors will be in demand as more programs will appear with colour graphics.

(c) Tape drives will disappear, disk drives will be common and schools will have one or more printers.

(d) Some schools will establish mini-labs with a network connection and others will network classrooms to a central disk drive.

(e) There will be an increase, rather than a decrease, in the different types and models of micro-computers in each school or district as the IBM and ICON come on the market along with the newer models from existing

co companies. (e.g. The Macintosh and Lisa from Apple, the Commodore 264 and 364 plus the Tandy 2000). Schools within each board or district might switch micros in order to have only one type in each school but I doubt if this will happen or should happen as each school will want the latest model. A word of caution however. Elementary schools should seek microcomputers that have simple, reliable, "user-friendly" operating systems that students and teachers can easily use and not trade for specialized machines with increased built-in memory. (A Toyota may get you to your destination as quickly and easily as a Mercedes.)

(f) Different sized disks will be developed. Some will be smaller to fit smaller microcomputers and will hold more infirmation than larger disks now available.

(g) Different types of peripherals such as music synthesizers, voice boxes, robots, modems and creative boards without keys will increase.

(h) As more resource materials in school libraries are catalogued on microcomputers and more local data banks are established, more schools will be connected by modems so students can do on-line searches.



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(i) Schools will continue to raise funds to buy more hardware and software outside the school budgets from taxation.

Recommendations:

(a) That each board or district establish a repair service to keep the microcomputers in active use in the schools.
(b) That micros be regarded as consumable supplies that will need to be replaced and updated.
(c) That the leaders in microcomputer literacy from industry, business and education inform school personnel of the current and future trends for equipment purchases.
(d) That all schools look at purchasing proper desks or tables with wheels that enable the students to comfortably use the equipment and allow it to be moved to different locations within the school.

B. SOFTWARE:

Elementary and secondary schools with the Commodore Pet and 64 microcomputers are equipped with a number of public domain programs from the Ontario Educational Software Project. Schools with the Apple micro have access to a number of programs produced by the Minnesota Educational Computing Consortium. Many boards of education are producting their own programs by hiring programmers to work with teachers on suggested topics. Programs "story boarded" by teachers from in-service courses are often produced by secondary school student programmers. Some individual teachers, with an interest in programming, are even producing their own. Some districts or boards have produced a catalogue (using the micro) of the programs available and distributed it to all schools. Teachers can order and have them sent to the school for the nominal cost of the tape or disk. Other areas require that the teachers come to the district resource centre and do their own copying while others have technicians to copy and send the disk or tape to the school.

Many schools in Southern Ontario are equipped with tape drives and the programs on tape cassettes are stored in cardboard boxes or tape albums to accompany the microcomputer as it moves from classroom to classroom. Often these tapes go out of adjustment and will not load the program into the micro which causes much frustration on the part of the student and teacher.

Some Predictions:

(a) The quality of the programs will improve. Already programs are being produced that enable the user to reverse to previous screen faces. More programs are being made that can be easily adapted to different level of ability. More are using the power of the computer and graphics that make the program more meaningful and interesting to the students.
(b) The quantity will increase from more sources. Commercial software companies will make more available. Programs produced by boards or districts of education will be distributed to other boards through a central clearing house.
(c) Each school and teacher will build an individual library of programs on disk.
(d) Each child will have his own disk for creative writing and for using other programs.
(e) The incompatibility of machines will remain for a few years requiring seaprate disks for different makes of microcomputers. Eventually an electronic device or software program will modify machines to accept other programs. Some manufacturers are aware of the incompatibility problem and are presently producing micros that will accept similar business software. For example, the Lisa 2 will accept software written for the Macintosh, and Tandy's new 2000 machine is compatible with the IBM PC operating system. Educational software will follow this lead.

Recommendations:

(a) That each board or district of education produce a software catalogue with a detailed description of each program to help teachers when ordering new materials.
(b) That each board or district of education make programs easily accessible to teachers.
(c) That each board or district of education establish a policy on purchasing or trading programs from other sources and belonging to a clearing house group.
(d) That increased attention be paid to the copyright laws of licenced and protected software.
(e) That commercial software companies produce documentation with each program that gives suggested pre and post user activities.
(f) That teachers pay attention to software rather than hardware and that teacher groups preview and plan suggested pre and post activities to connect programs to the curriculum.
(g) That each school establish an orderly filing and distribution system for students and teachers.



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C. USE OF MICROCOMPUTERS IN SCHOOLS:

Different philosophies develop within each school or classroom on how the micro should be used. Some examples are quoted below.

(a) "All children from Kindergarten to Grade 8 should be able to load and use prepared programs on a regular basis."
(b) "The microcomputer should be used as a reward for good behaviour or work."
(c) "It is a privilege to use the microcomputer therefore responsible behaviour is required: the privilege denied to irresponsible students."
(d) "The microcomputer is to be regarded as a tool similar to an overhead or film projector and used when necessary."
(e) "The microcomputer should receive maximum use as a tool to assist learning."
(f) "Computer literacy should be taught to all students as a separate course on a regular basis."
(g) "Microcomputer learning should be integrated into the classroom curriculum and not be taught as a separate subject."
(h) "All children from Grade 3 to 8 should learn programming skills in basic language."

Other schools and teachers have different philosophies as well as a combination of the above. Therefore, how the micro is used in the elementary school depends upon the philosophy and education in the use of micros by that of principals and teachers as well as the number of machines and peripherals available.

A survey in the U.S. by the John Hopkins Centre for Social Organization of Schools found that philosophies of use differed according to socioeconomic status. In lower-income communities with different minority groups, schools try to bring up the achievement level by giving more time on the micro to below-average students. In predominantly white low middle-income communities, the schools give their better achieving students more access to micros, with challenging programs, thus freeing the teacher to give more personal attention to the slower learning students.

This survey also found that as elementary schools get more micros, they give access to more students, while as secondary micros, they give access to more students, while as secondary schools get more micros, they give longer access to the same number of students.

Patterns for distribution within the school.

(a) One or two micros are placed in the resource centre or the principal's office and signed out by the teacher when required. Some schools reported that the equipment was used no more than an hour per day.
(b) One or two micros are placed in the classrooms of interested teacher and stay there.
(c) One or two micros are rotated to interested teachers with a variety of schedules, E.g.: (i) every other day; (ii) every third day; (iii) one week a month; (iv) every third month, etc.
(d) One or two micros are rotated to every classroom in the school with the same variety of schedules as above.
(e) A micro is given to every three teachers to schedule as they wish (again with same vareity of schedules).
(f) A micro is placed in every classroom.
(g) A mini-lab is established in a vacant classroom.

I Uses within the Classroom

The micro is set up as a learning or activity centre with each student scheduled singly or paired for fifteen or twenty minutes at a time. The most common types of programs used are listed below.

(i) Logo - Usually challenging problem-solving activities are given to move the turtle through mazes or to make geometric shapes in different colours.
(ii) Drill and Practice - Public domain or commercial game type programs are selected in Mathematics or Language. e.g.: "Fun Machine" and "Word Attack".
(iii) Simulation - Public domain or M.E.C.C. programs related to Science or Social Science are most often chosen. e.g.: "Lemonade Stand", "Water Pollution", "Odell Lake".
(iv) Data Base - Information stored on disks is retrievable e.g. "The First Fleet Data Base" produced by the Tasmania Education Department provides a manual for teachers on the various ways to request and retreive information.
(v) Adventure Games - Challenges are given for students to solve e.g. "Treasure Island" and "Cave Adventure".



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Some schools have established a scheme whereby every student in grades 1, 2 and 3 is paired to work on the microcomputer with an older student from Grades 5, 6 and 7. (Sometimes this is called the Proctor Scheme which will be explained later.)

* The greatest single factor in the effective use of the micro is the classroom teacher. To quote a poster I saw on the wall of a classroom in Winnipeg "Teacher Make the Difference".

II Uses Within a Mini-Lab

A vacant classroom is equipped with tables and chairs and electrically wired to accept six to twelve microcomputers along with disk drives and printer(s). A teachers' aide, parent volunteer, retired teacher, staff member or senior student knowledgeable in computer operation is selected by the school to supervise the lab when students are present. Parent volunteers are most common in California, Hawaii and Australia. Government funds for job retraining are often used in Canada to hire supervisors.

The classroom teacher along with the lab supervisor decide upon the programs to be used when each group of students comes to the lab. Below are the most common types of activities used with eight to thirteen year old students.

(i) Drill and Practice - The same type of game program is selected with varying levels of difficulty for different levels of ability in Mathematics and Language.

(ii) Keyboarding Skills - Game type programs are used to drill faster use of the keyboard. e.g. "Mastertype" and "Typing Tutor".

(iii) Word processing - The micro is used to assist story writing, editing and printing. e.g. "Bank Street Writer" and "Storywriter".

(iv) Programming - Students are taught programming skills in either the Basic or Logo language.

After each session a report of individual progress is recorded and sent back with the student to the classroom teacher in order to plan the activities for the next lab period.

"In general, the longer schools have microcomputers, the less they use them for drill and practice and the more for instructions in programming." (Henry Becker, Hohn Hopkins Centre for Social Organization of School, Nov. 1983)

I believe that keyboarding word processing and data retrieval will replace the programming emphasis that exists today. As teachers learn more about using the micro as a tool to develop curriculum, the less they will teach programming. For example when I asked one teacher why he was teaching his Grade six class programming in Basic, he replied "I don't know what other use to make of the microcomputer in school."

From my observations in many schools, the programs seemed to be more effectively used in a mini-lab setting than when used in individual classrooms. There are many reasons for this. The lab supervisors in most cases, were better prepared in using the programs than the classroom teachers who had little or no instruction in setting up a microcomputer learning centre. It was also easier to supervise part of a class on one task than a whole class on many.

When a whole class used the microcomputer lab, (15 micros) the classroom teacher was able to assist the lab instructor thus providing two supervisors per class. Teachers need never fear that they will be replaced by a machine but must be aware of its power to assist learning.

Some educators believe that you will never be able to intergrate the micro into the curriculum if you move it out of the classroom because computer literacy will be regarded as a separate curriculum like Physical Education and Music. However, we move students to the library to use materials for subjects other than Reading and often move to other areas of the school to watch a film or television program. There is merit in using the micro in both the classroom and the mini-lab.

* In either situation, effective use of the micro still requfires more of the teacher's already busy time in previewing and planning to use new courseware.

III Computer Clubs

The Computer Clubs have been formed in many elementary schools. Interested students meet with a teacher who is interested in micros before and after school in a mini-lab setting. Usually the emphasis is on writing programs in basic language or playing computer games which may or may not be related to education. Some schools with micros have refused to establish computer clubs because they could not handle the student demand.



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Recommendations (I) for Schools

1. Principals should become aware of the potential of the microcomputers in education so as to initiate and support teachers in purchases of hardware and software. They should also be aware of different patterns for school organization and lead in the development of school policies for the use of micros.
2. There should be a microcomputer contact teacher established in every school. This may or may not be the principal but should be a person that is knowledgeable of the process for developing change and of the operation of a microcomputer.
3. The contact teacher should
   a) assume responsibility for arranging micro schedules to classrooms for a least a month at a time with frequent follow up periods, (thus more than one or two micros are needed per school), helping teachers and students operate the equipment, ordering programs from the central office and showing new programs to teachers;
   b) be a member of the school Microcomputer Committee which would bring forth recommendations for acquisitions of hardware and software;
   c) be sent to microcomputer conferences and shows in order to keep up to date with new trends.
4. Teachers need to develop strategies for use of the microcomputer within the classroom so each student has equal time on the equipment.
5. A central filing system for back up copies of all software should be established in each school library. As the amount of software increases, a data file should be prepared on the microcomputer to aid searches for particular topics.
6. As more data bases are established, schools should investigate the use of a modem to share program distribution and student/teacher searches.

Recommendation (II) for Effective Use of a Microcomputer as a Learning Centre in a Classroom

1. Arrange the keyboard and disk drive for comfortable operation and the monitor for easy viewing by students.
2. Place the centre in such a location that students can move to and from conveniently but within view of the teacher.
3. Teach all students how to load and use the micro independently.
4. Select materials that meet student interest and ability and pedagogically plan pre and post utilization activities that link them to the curriculum being studied.
5. Arrange all materials in a convenient and orderly manner and establish a utilization schedule.
6. Develop clear rules of behaviour expected. The use of the micro should be viewed as a privilege and all students should respect the proper use and care of equipment and materials and follow the posted schedule.
7. Have no more than two students at the micro at one time. (Three's a crowd.)
8. Allow no recreational games to be played in school time.
9. Observe student use and performance and record it daily. Attention to progress allows the teacher to adapt programs to meet levels of ability.
10. Evaluate the results of each student to determine the need for more or less time, different educational software or different use of materials or equipment. For example drill and practice fast-paced activities require short attentive time periods.
11. Establish the centre over an extended time period to make it an integral part of learning in the classroom.
12. Develop the use of two hands on the keyboard as soon as the students are ready. (Grade three and up.)

* Students at all activity centres, with or without a micro, need teacher guidance, encouragement and supervision.

D TEACHER TRAINING - (I) - In Service

Many boards or districts of education have implemented microcomputer sessions of varying types and length to help teachers and principals become more aware of the potential of microcomputers in education. For example, during Professional Development Days, teachers spend a half or whole day learning computer awareness activities or previewing programs in a curriculum subject or at a grade division. Professional upgrading courses for two or three hours over four or five evenings are offered on such topics as, teaching with a computer, software evaluation and design, storyboarding, Logo theory and activities, word processing and programming.

Faculties of Education in Ontario offer a 125 hour course "Computers in the Classroom" Part 1, 2 and 3 which is recognized by the Ontario Ministry of Education for additional certification. These courses have been most popular in recent years by practicing teachers who have taken them evenings during the winter or at summer school.



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Teacher training colleges in other parts of the world offer courses at the graduate level for teachers. Many Colleges of Advanced Education in Australia offer graduate diplomas in "Curriculum-Computers in Education." Such courses are even offered by correspondence to teachers in remote areas where they have access to a micro. Colleges and univsersities in the U.S. offer Masters' Degrees in Educational Communications and Technology with a microcomputer emphasis or option.

Community Colleges, private companies and Educational Television programs offer courses in computer awareness, microcomputer operation, word processing and programming.

Many opportunities are available for teachers to become knowledgeable in computer learning.

Teacher Training (II) - Pre-Service

Most facilities or colleges of education offer electives or options on microcomputers to student teachers. All facilities have established one, two or three labs with twenty or more micros along with peripheral equipment such as disk drives, printers, etc. The courses vary from twenty to fifty hours and are usually taught by faculty members from the Business, Computer Science, Mathematics or Educational Technology Department. The emphasis in these courses vary from complete programming in Basic to using the microcomputer as a tool in CAI, CAL and CML to develop curriculum. In one college, the students kept requesting Basic programming because they believed they must learn it in order to use a micro in the school and because it gave them another job option upon graduation.

Recommendations:

I Boards or District of Education should adopt the following.

(a) Continue to offer short courses from two or ten hours for teachers on a variety of topics on using the microcomputer.

(b) Familiarize subject consultants on program availsbility, utilization and evaluation procedures in order for programs to be integrated into the curriculum. Teachers want ideas on how to use computers in their particular curriculum areas of Natural Science, Social Science, English, etc.

(c) Offer courses to parents on computer literacy and keep them informed on how students are using the micro at school. This is especially important not only because education seeks community support but to help educate the people that did not have a previous opportunity to learn about computers. If we do not, we may face a similar "new math" backlash from the adult community.

(d) Establish specific guidelines and directions for microcomputer applications within schools.

(e) Make more use of the "student helping student" or "Proctor Scheme" within schools as described below.
  (i) Grade 5, 6 7 & 8 students are trained to work with Grade 1, 2 3, & 4 children in methods of guiding students to discover learning.
  (ii) Each older student is paired with a younger student over an extended period of time (4-6 months).
  (iii) Schedules are established and the older student:
    (1) picks up the younger child with his file card,
    (2) moves to the micro and loads the required program,
    (3) records the progress made at the end of the appointed time (depends upon the age and interest of the child),
    (4) shows the chart to the classroom teachers who records the next assignment,
    (5) returns to classroom.

Schools, where the above scheme is in operation report that more responsible attitudes and behaviour develop with the older students and that the pairing proves useful with other school activities where teachers need help.

II Faculties and College of Education should adopt the following.

(a) Continue to offer the "Computers in the Classroom" course as an additional qualification although programming in Basic should be an option and not part of the required section. More emphasis should be placed on developing strategies for effective calssroom use by teachers and students as well as the preparation of support materials for existing and planned programs.

(b) Offer short non-credit courses for classroom teachers, principals and consultants on a variety of topics such as
  (i) implementing microcomputers into the classroom,
  (ii) Logo theories and activities, (Logo should not be taught in isolation from its philosophical and educational foundations),
  (iii) software evaluation and design,



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(iv) using word processing to develop writing skills,
(v) storyboarding to develop new microcomputer programs,
(vi) strategies for developing administrative applications (school records, report writing, information retrieval).

(c) Provide opportunities for faculty to
(i) be knowledgeable for the present uses of micros in the schools,
(ii) be knowledgeable of the different types of programs that are available in the curriculum areas,
(iii) learn how to integrate the micro into their specific curriculum disciplines,
(iv) suggest areas where microcomputer programs could effectively aid student learning,
(v) develop research into microcomputer utilization.

Once faculty members have become familiar with micros it is imperative that they integrate this tool into their curriculum classes both at the preservice and inservice level. A microcomputer connected to large monitors will be necessary in lecture rooms for faculty to demonstrate programs and utilization procedures.

Public domain programs and facilities for copying will need to be made available to students in order for them to integrate the micro into their practice teaching.

As the numbers and uses of microcomputers expand there are many questions that will need answering. For example:

1. Does programming help a child become a better thinker, learner or problem solver?
2. Is the "Logo" approach or theory an effective way of learning or problem solving?
3. Are CAI programs as effective as teacher instruction?
4. Do drill and practice programs improve the skills to be learned?
6. Why retain the QWERTY keyboard?
7. Do simulation programs aid learning or are they simply game activities?
8. Does the microcomputer help the child with special needs more effectively than the present methods?
9. Do word processing programs such as "Storywriter", "Bank Street Writer", etc., help improve student writing?
10. What effect has the microcomputer had on the classroom? the school? the community?

## WE HAVE ONLY JUST BEGUN

Acknowledgements

Many thanks to the teaching staff and administration of the following boards, districts and colleges of education for the assistance and hospitality given in the preparation of this report.

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III NEW ZEALAND

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## IV AUSTRALIA

**Australia Capital Territory**
A.C.T. Schools Authority. Australia National University. Canberra College of Advanced Education. Canberra City Education Clinic. O'Connell Education Centre. A.C.T. Schools Authority.

**State of New South Wales**
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**State of South Australia**

Angle Park Computing Centre, Department of Education, Adelaide.

### ROBOTICS, COMPUTERS, AUTOMATION & YOU!

Donald E. Coulman, Guelph, Ontario

Manufacturing robotics and office automation have had and will continue to have dramatic effects on the Canadian industrial (post industrial?) society. The following areas will be considered during this presentation:

Robotics in Canadian industry - structure, applications, present and possible future effects on the Canadian society;

The automated office - word processing ... Job opportunities for the future? Women are especially hard hit by the effects of the automated office;

Manufacturing sector vs the services sector of the Canadian economy;

Unions and government...What can they do?

To most people, the word "Robot" * brings to mind a ponderous, clanking device with human characteristics. The industrial robot bears no resemblance to this view at all! Instead, the robot used in industry takes the form of a single arm which can be driven through six axes by a complex mechanical combination of motors, gears and pulleys. (fig. 1) The business end of the robot arm might possess: a gripper for assembly/ material handling work; a spray painting nozzle; or, a welding device. The complete operation and movement of the robot is choregraphed by a computer programme.

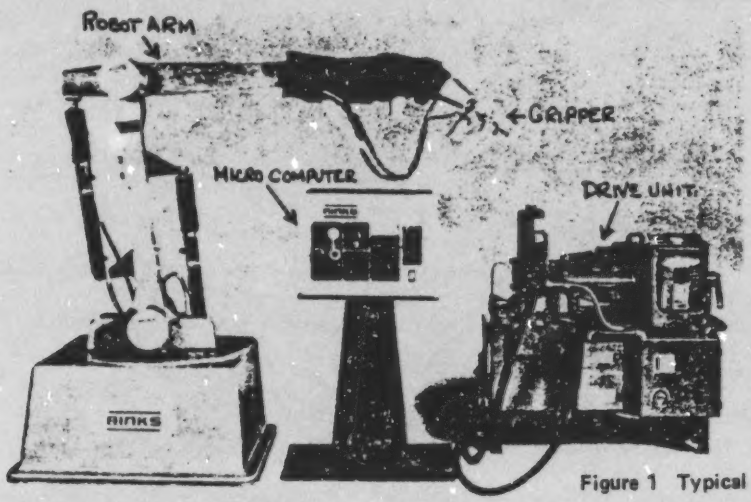


Figure 1 Typical Industrial Robot

* The word "Robot" is derived from a Czech word meaning forced labour. Czech playwright, Karl Capek invented the word for use in his 1921 play, "R.U.R." (Rossum's Universal Robots" - a drama in which mechanical robots, each of which lacks a soul, turn on their human makers and destroy them.)



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# AMTEC '84 ...A Kaleidoscope of Media

The Robot Institute of America has provided the following definition for an industrial robot:[1]

> A robot is a REPROGRAMMABLE, multifunctional MANIPULATOR designed to move material parts, tools, or specialized devices through variable programmed motions for the PERFORMANCE OF A VARIETY OF TASKS.

Producing goods in Canada is changing from a labour intensive base to one involving automated equipment and robotics (capital intensive). Pressure from foreign competition will accelerate this change. Crozier reported:[2]

> The answer is that we are being outgunned by the opposition. Our productivity is lower than that of our competitors and we are losing the markets to foreign competition.
>
> The traditional ways of manufacturing by hand are labour intensive. Canada cannot compete directly with the developing countries by using traditional methods because of the high cost of our labour. We must implement high tech methods to give manufacturing some leverage.

The Japanese have led the industrialized world in the use of robotics (fig. 2) It is ironic that the Japanese capitalized on a device that was solely developed in the United States.[3] At present, the 6500 robots in the United States are being used in the following industrial applications:

| | |
|---|---|
| Material handling | 1,950 |
| Machine load/unload | 1,470 |
| Spot welding operations | 1,190 |
| Die castring | 880 |
| Painting | 290 |
| Arc welding | 270 |
| Miscellaneous | 450 |

In Canada, the vast majority of robots are used in the automotive industry (fig. 3)

Just how effective is a manufacturing system utilizing automation and robotics?

Two examples:

A. Fanuc Facotry . . . Japan
. product: D.C. and A.C. spindle motors
. manufacturing rechnique . . .

Robots & Automation

49 robots
5 automated material handling cars (robo-trailers)
60 workers
output: 10,000 motors/month
labour productivity increase: 70%

Conventional

100 workers
output: 6000 motors/month

B. General Dynamics . . .
Fort Worth Texas
. product: sheet metal parts for military aircraft
. before robot:
one worker could produce 6 parts/shift with a 10% rejection rate . . .
. with robot:
30 parts/shift with a 0% rejection rate
. saving with robot: $93,000/year

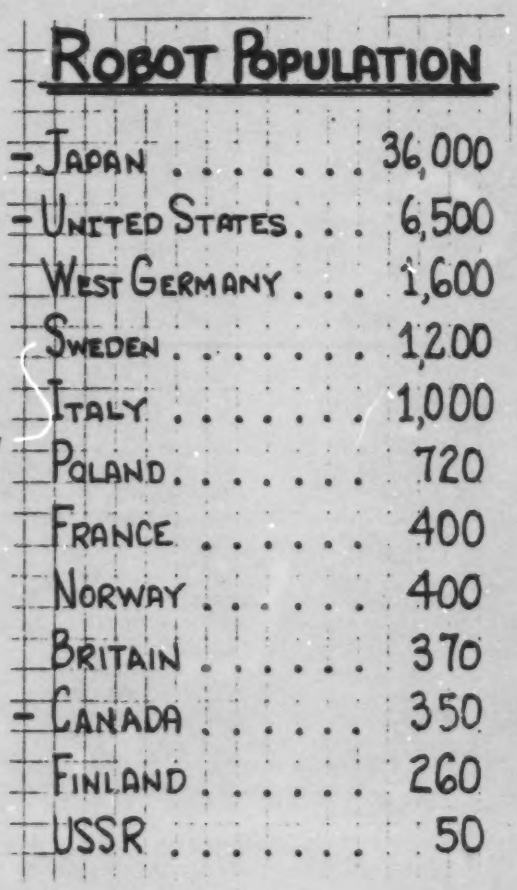
ROBOT POPULATION
JAPAN . . . . . 36,000
UNITED STATES . . . 6,500
WEST GERMANY . . . 1,600
SWEDEN . . . . . 1,200
ITALY . . . . . 1,000
POLAND . . . . . 720
FRANCE . . . . . 400
NORWAY . . . . . 400
BRITAIN . . . . . 370
CANADA . . . . . 350
FINLAND . . . . . 260
USSR . . . . . 50

Figure 2.



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# AMTEC '84 ... A Kaleidoscope of Media

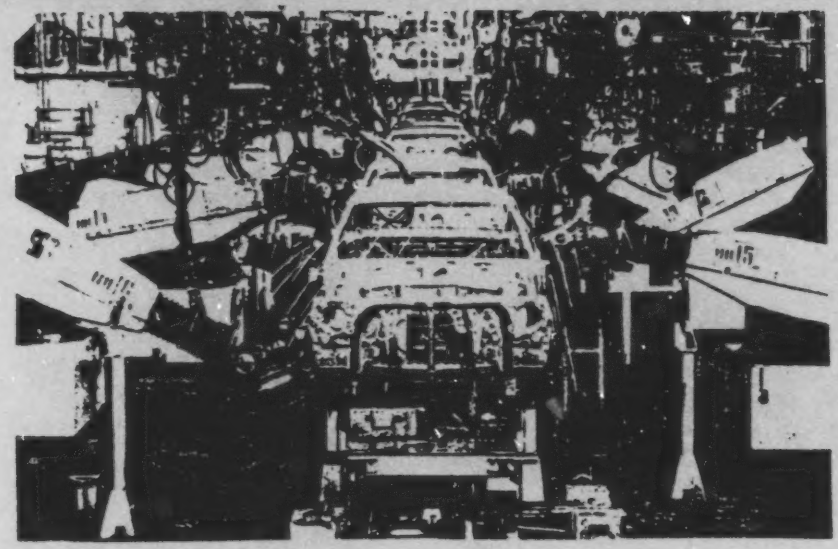

Figure 3. Robots at work in an automotive factory.

The popular idea that: "There will be more and better jobs because of computers, automation and robotics," simple cannot be defended. Professor C.C. Gotlieb, a long time expert in computer programming and technology, is direct: "... there is clear evidence that the extra jobs created by the computer industry itself do not begin to make up for the jobs which are lost. In my personal view, computers are job killers and the sooner we accept this, the sooner we will start to deal with the implications effectively."[4]

Gotlieb cited the employment history of the switching division of the United States company, Western Electric, as one example of his view (fig. 4)[5]. With the introduction of automated equipment, Western Electric was able to reduce the number of employees at the switch plant by one half while doubling productivity. This was accomplished over a ten year period.

Closer to home, the H.A. Simons Company - a Vancouver based engineering firm which builds pulp and paper mills - had a similar experience. Now that a computer aided design (CAD) system has been installed, 800 employees are able to accomplish the same amount of work as 1000 did using traditional methods (one draftsman at a CAD terminal can do the same amount of owrk as 3 - 8 draftsmen at drawing boards).[6]

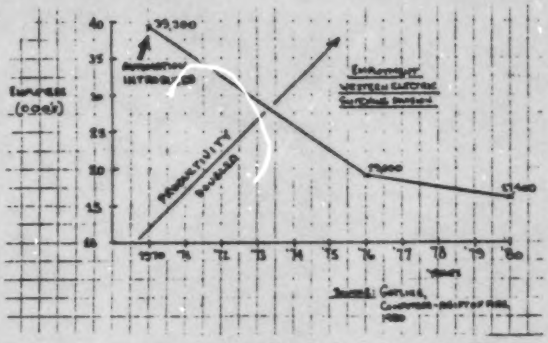

Figure 4 . . . Automation and employemnt at Western Electric.

Women presently in the Canadian work force will be hard hit by the introduction of labour sawing automated offices and word processing units. Dr. Ratna Ray, the director of the Women's Bureau, Labour Canada has reported[7] that 40% of the Canadian work force consists of women - 65% of the women in this group require a regular job pay cheque because they are single or single parents. A large percentage of the working women (74%) are employed in jobs that are at risk - typists, clerks, secretaries and bank tellers (only 5 out of every 100 Canadian working women are employed in managerial or academic jobs).

In 1950, approximately one job in four was in manufacturing and construction work. Today, the ratio is one manufacturing and construction job to eight other jobs. Children from working class families who graduated from high school in the 1950s and 1960s could count on being able to choose among several well paid jobs - the very jobs that are now disappearing because of the introduction of automation.[8]



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# AMTEC '84 ...A Kaleidoscope of Media

The North American economy has been undergoing a gradual change from a manufacturing based economy to a services based economy. The United States Labour Department recently released [9] a report which states that there are 18.8 million workers in the manufacturing sector and 19 million in the services sector (fig. 5)[10] of the economy (an increase of 55.3% in 10 years). It is projected [11] that by 1995 there will be 28.5 million services employees and 22 million employees engaged in manufacturing (McDonald's now has more employees that U.S. Steel. See Figure 6 [12] for the job opportunities of the future.).

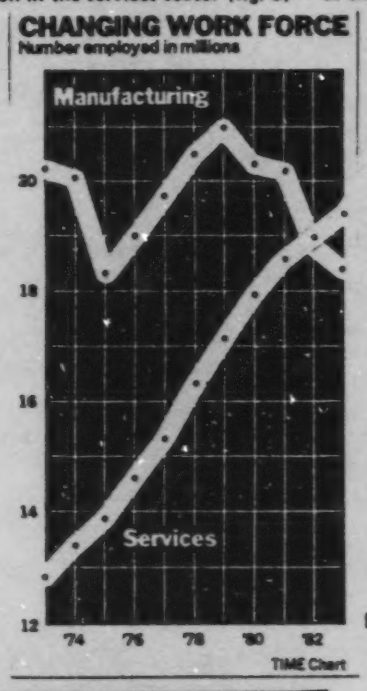


Figure 5.

In a services economy, there are a relatively few high paying jobs at the top and a great many low paying jobs at the bottom. Very few high paying production jobs exist in the middle. An $18. per hour welding job is taken over by a robot which costs $5. per hour to operate - there are few jobs in restaurants and hotels which pay $18. per hour.

Unions, which, traditionally, have been able to keep workers' wages reasonably high, are facing tough times. Union membership is shrinking (Fig. 7) [13] Unions have not been very successful organizing fast-food workers, store clearks or hotel employees.

The high technology sector of the economy cannot be counted on to provide many new jobs. The industry consists of a small number of elite, professional and very productive workers. As well, much of the new, sophisticated computer equipment is self diagnostic; therefore, very few repair workers are required.

Is there a solution? The Canadian Labour Congress [14] has suggested that the benefits of work can be spread more widely by: reducing the work week; sharing, with the workers, the increased productivity created by new technology; early retirement; retraining (How do you retrain a 45 year old laid off machinist to be a smiling low paid hotel porter?); and, a ban on overtime.

Wassily Leontief, an eminent American economist, has proposed that: (a) the government supplement the pay of workers who voluntarily cut back to a three day work week at age sixty; (b) working parents, who might be working longer hours than they would like, could work half time for, say, a period of five years - their pay would be supplemented by the government so that they would receive full pay for half time work. Although the scheme would be very expensive in tax dollars over the short term, Leontief figures that the millions of new jobs created would generate strong economic growth and; therefore, more tax revenue.

Your solution?

**HELP WANTED**
Number of jobs in thousands

| | 1980 | 1995 | + or − |
|---|---|---|---|
| **Ten best prospects...** | | | |
| Secretaries | 2,469 | 3,169 | +700 |
| Nurses' aides | 1,175 | 1,682 | +507 |
| Janitors | 2,751 | 3,253 | +502 |
| Sales clerks | 2,880 | 3,359 | +479 |
| Cashiers | 1,993 | 2,445 | +452 |
| Nurses | 1,104 | 1,542 | +438 |
| Truck drivers | 1,696 | 2,111 | +415 |
| Fast-food workers | 806 | 1,206 | +400 |
| Clerks | 2,395 | 2,772 | +377 |
| Waiters | 1,711 | 2,072 | +361 |
| **Ten worst prospects...** | | | |
| Postal clerks | 318 | 310 | −8 |
| Cutlery | 296 | 287 | −9 |
| Shoe machine operators | 65 | 54 | −11 |
| Compositors and typesetters | 128 | 115 | −13 |
| Graduate assistants | 132 | 108 | −24 |
| Servants | 478 | 449 | −29 |
| College teachers | 457 | 402 | −55 |
| High school teachers | 1,237 | 1,064 | −173 |
| Farm laborers | 1,175 | 940 | −235 |
| Farm operators | 1,447 | 1,201 | −246 |

Figure 6.



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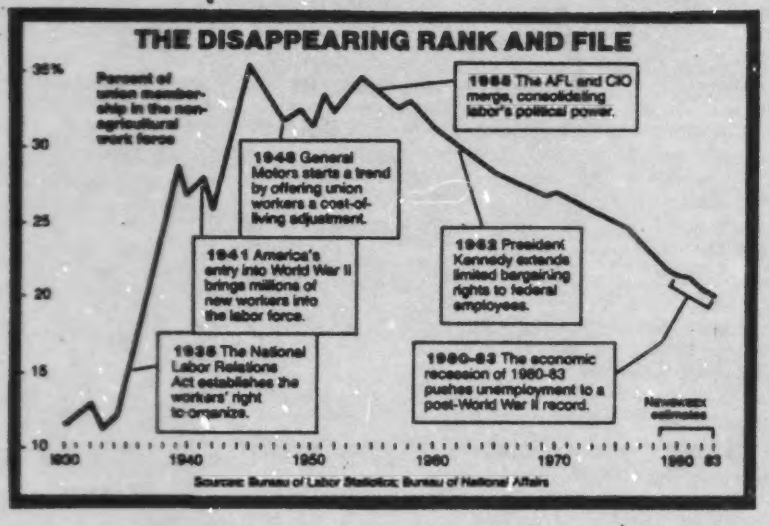
THE DISAPPEARING RANK AND FILE
Percent of union membership in the non-agricultural work force
35%
30
25
20
15
10
1930
1940
1950
1960
1970
1980 83
1935 The National Labor Relations Act establishes the workers' right to organize.
1941 America's entry into World War II brings millions of new workers into the labor force.
1948 General Motors starts a trend by offering union workers a cost-of-living adjustment.
1955 The AFL and CIO merge, consolidating labor's political power.
1962 President Kennedy extends limited bargaining rights to federal employees.
1980-83 The economic recession of 1980-83 pushes unemployment to a post-World War II record.
Newsweek estimates
Sources: Bureau of Labor Statistics; Bureau of National Affairs

Figure 7.

NOTES

1 Fu, "Robotics and Automation" 13.
2 Crozier, "Integrating CAD/CAM; The HIGH TECH Manufacturing Option", S25.
3 Barrie, "Robots: Machines That Want To be Like MAN," S34.
4 Gotlieb, "Computers - A Gift of Fire", 865.
5 Ibid., 864.
6 Stoffman, "Arm in Arm", 40.
7 Ray, "The Automated Office and Its Challenge for Women", 28.
8 Kuttner, "The Declining Middle", 60.
9 Alexander, "The New Economy", 62.
10 Ibid., 64.
11 Ibid., 64.
12 Ibid., 62
13 Anderson et al, "The Rise and Fall of Big Labour", 51.
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15 op.cit., Kuttner, 72.

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AMTEC '84 ... A Kaleidoscope of Media

# CONTROL STRATEGIES AND IMAGE PLACEMENT CONDITIONS IN A COMPUTER-ASSISTED INSTRUCTIONAL UNIT

Robert M. Bernard and Claude Pineault
Concordia University

At an ever increasing pace, image reproducing systems (e.g. videotape, slides) are being married with computer-based instructional systems with the intention of capitalizing on the presumed learning advantages of each. Although a great deal has been said about such combinations, only a modest amount of research has emerged to demonstrate the potentials of computer-image hybrids and to suggest how design alternatives might affect the attainment of learning outcomes. The research reported here is an exploration of two such variables - control strategies for time-on-task and image (e.g. content-related illustrations) placement - and their effect on verbal learning of textual frame content, acquisition of terminology and attitude change. Two levels of control were operationalized: one which allowed students to control their own study time (hereafter referred to as Student Control) and one in which study time for both textual frames and illustrations was limited to pre-established norms (hereafter called Machine Control). Image placement had two levels: Parallel Placement and Serial Placement. In the Parallel Placement condition images appeared concurrently with the verbal instructional frames (verbal material appeared on a CRT, while images appeared on a Caramate screen located next to the CRT). In the Serial Placement condition the images appeared on the Caramate screen after the verbal material had been removed. A control condition in which only the verbal material appeared was also included in the design. After each frame (30 verbal frames and images were used) students responded to a question taken from the verbal frame and received appropriate feedback.

Design and Subjects.

One-hundred and eight subjects participated in the experiment. These were randomly assigned to one of the six cells in the 2 x 3 x 2 mixed factorial design. Testing Time - immediate and delayed - served as a repeated factor.

Materials.

The instructional unit dealt with the structure and function of the human eye and was adapted from a programmed instructional unit developed and validated by Kulhavy, Anderson and Malczynski (1971). The images were developed from the text and were reproduced on 2 x 2 slides. A control link was developed to join the Apple II and Caramate which allowed control of the advance mechanism and the light.

Two measures of verbal learning were used: a recongition test (15-item multiple-choice test) and free recall (ie. subjects were asked to recall and write down as much as they could remember). Attitude toward computer-based instruction was measured with a standardized instrument developed by Brown (1966). Terminology acquisition was measured with a pictorially-based recall test (adapted from Dwyer, 1978).

Procedure.

Subjects were run individually. Twenty-five subjects in the Student Controlled conditions were initially tested to establish average study times for the Machine Controlled conditions. An average study time was calculated for each of the 30 frames in each of the image and non-image conditions. In general Machine Controlled subjects indicated that they had plenty of time to read the verbal content and view the images. Delayed testing occurred two weeks after the initial experimental runs.

Results.

Multivariate analysis of variance with repeated measures was used to test for group differences in the main design. Analysis of covariance (i.e. with the pre-attitude measure as a covariate) was used to test for differences in attitude after the administration of treatments.

The results of the multivariate tests indicated a significant interaction between Control Conditions and Image Placement. Examination of the univariate tests (individual tests by dependent measure) revealed that all three dependent measures contributed to this interaction. Figures 1, 2 and 3 show the pattern of mean efficiency scores across the design of the experiment (i.e. the dependent variables were converted to efficiency scores by dividing raw scores by time spent).

In addition, the test of significance for attitude revealed an interaction between Control Conditions and Image Placement. This interaction is shown in Figure 4.

Discussion.

The results of this study suggest that there may be advantages in each approach to control depending upon the nature of the instructional content and particularly, whether images are to be included. It is fairly clear that serial placement



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does not result in the same support for the verbal content frames as does parallel placement. However, results obtained from the terminology measure indicate a similar effect for both parallel and serial placement strategies. These and other issues will be presented and discussed in greater detail.

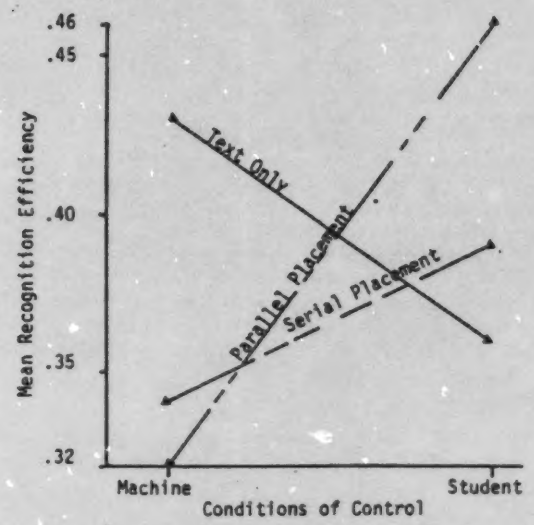


Figure 1. Mean Recognition Efficiency Under Conditions of Control and Image Placement.

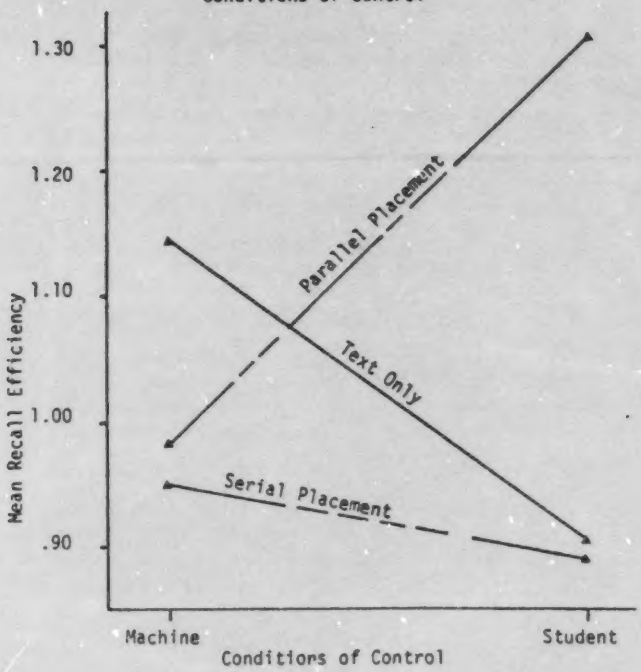


Figure 2. Mean Recall Efficiency Under Conditions of Control and Image Placement.



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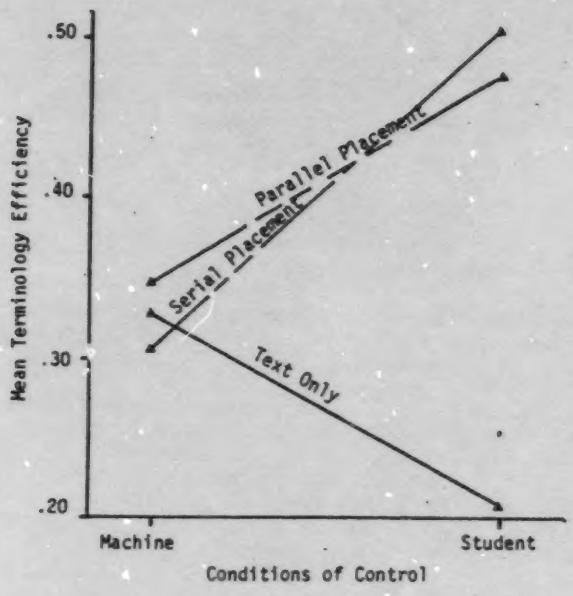


Figure 3. Mean Terminology Efficiency Under Conditions of Control and Image Placement.

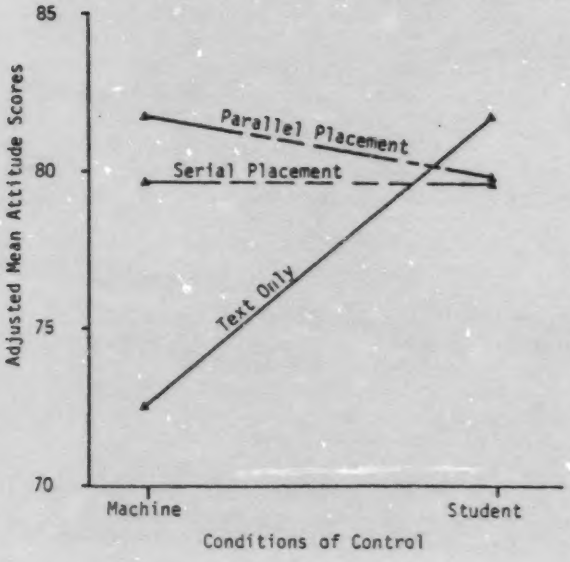


Figure 4. Adjusted Mean Attitude Scores Under Conditions of Control and Image Placement.



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# NATURALISTIC EVALUATION IN ACTION

by Mary F. Kennedy

Division of Learning Resources, Faculty of Education

## Introduction

This paper describes a unique course evaluation project. Two graduate students enrolled in an advanced instructional development course were assigned, as a semester project, the task of comprehensively evaluating a basic instructional development course.

## The Purpose

The evaluation project served four purposes:

1. The advanced graduate students had an opportunity to work in the planning, implementation, and reporting of a real and meaningful evaluation - one that was broad enough in scope to provide training in a variety of evaluation techniques. Such training is not readily available in most graduate programs.
2. The basic instructional development course was thoroughly evaluated from the varying perspectives of students, the instructor, the department, and related divisions within the system, with a view toward improving the event for all involved. The suitability of the course for the diverse groups of students enrolling was an issue worth exploring.
3. The project provided the opportunity of testing many nad diverse qualitative research techniques, and their suitability to educational evaluation. These techniques have had limited application to this time, and projects that employ such techniques can make an important contribution to the field of evaluation.
4. The evaluation served as a model for the faculty. A faculty committee is currently examining the thorny issue of faculty and course evaluation. Committee guidelines mirror the approach to faculty evaluation outlined by Braskamp (1980) who recommends "instructional and course development, individual consultation on instructional design, and instructor and course evaluation" (p. 45).

## The Setting

The project site was the Division of Learning Resources, Faculty of Education, Memorial University of Newfoundland. The division offers a graduate program in Educational Communications and Technology.

Included in the graduate program are two courses in instructional development. The basic course is a practicum in which students, guided individually by the instructor, follow a particular instructional development model to design an instructional product or event. The advanced course focusses on the evaluation of instructional programs, products, and events.

In searching for a suitable entity to evaluate, the author, who teaches both courses, decided to avail of the opportunity to evaluate the basic course. Since she was deeply involved in both courses, lending credence to possible claims of evaluator bias, another faculty member acted as project manager, monitoring the evaluation procedures throughout the project.

## The Approach

The project team designed the evaluation following the naturalistic approach. Guba (1978) states:

> Naturalistic inquiry has a certain special utility for the practice of evaluation because of a strong, current scholarly interest in moving away from more conventional paradigms; a strong movement among evaluation practitioners away from conventional methodologies toward more naturalistic approaches; and the emergence of a number of evaluation models which seem especially congenial to the use of naturalistic inquiry as a supporting tool or technique . . . (p. 80)

In keeping with the naturalistic paradigm the evaluation was discovery-oriented. The team explored the course milieu in its totality, gathering any and all information and impressions from all involved (Kennedy, 1982).

## The Techniques

The evaluation project utilized many and diverse data-gathering techniques commonly identified with naturalistic, emergent evaluations. These techniques provided both rich evaluation experience for team members and a rich data pool.



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Participant observations were used extensively, with team members attending class lectures throughout the course, sitting in on the individual instructor/student interviews which guide the development and testing of student projects, and attending to the less formal conversations and group discussions which take place over coffee and in graduate study rooms.

Documents and records were analysed, providing insight into the course philosophy, structure, and objectives. Student projects designed over the past four semesters were available, and examination of these projects provided data on course continuity and development.

Interviews and questionnaires were employed to rpovide data reflective of the various perspectives of all involved. Data was gleaned from the students, the instructor, directors and department heads who recommend the course to students, and those faculty members who have a knowledge of the course through service as content experts in the development of student projects.

The use of such a variety of data-gathering techniques provided opportunities for grounding the evaluation, for structural corroboration of data, and for step-wise replication, ensuring the adequacy and relevance of the evaluation outcomes.

## The Implications

The evaluation project certainly proved interesting in that its global nature provided for the development of a comprehensive course evaluation plan - one that is built on the cooperative efforts of the instructor and the evaluation team. The evaluation provided evidence of the relative merit and utility of the approach and the various techniques employed in the project. This project also served as a pilot study for a full-scale evaluation of the graduate program in Educational Communications and Technology.

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# EDUCATIONAL MEDIA AND TECHNOLOGY AS A SOCIAL INQUIRY: TEACHING INSTRUCTIONAL COMMUNICATION AS SOCIAL SCIENCE.

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The most important question we aks ourselves when we plan any course, and certainly a course in instructional communication is, "what is it that students need to know?" The answer would vary, of course, with the level and purpose of the course. I would suggest however, that as an introduction to instructional communication, students most need to know the origins, purposes, and effects of educational technology in society. It should be a social inquiry, addressing the foundational questions in education and in society itself.

I taught such a course first in a faculty of education, and currently in a department of communication studies within a faculty of social sciences. Though I have had students enrolling for at least three different purposes, I remain convinced that an introduction to instructional communication as social science serves all three best.

The first group of students is composed of those either planning to be, or already engaged in classroom teaching or educational administration and support services. At one time, these were the vast majority of my students, but even



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today they comprise a significant group. They tend to perceive their learning needs most narrowly, defining them in terms of direct classroom use and immediate application. They also tend to accept their own past or current school experience as the prime reality. While they generally hope to do as well or better than their own best teachers, their preconceptions of what an introduction to instructional communication should be correspond closely to the teaching aids approach, even if the teaching aids may be more digital than analogic.

The second group of students is composed of those planning a career in media production. There are many, of course, in communication studies, and they see themselves as future writers, researchers, and visual creators. They, too, tend to enter the course with preconceptions, though their concern is how to create instructional materials now. Why or with what effect media and materials are created and disseminated is secondary. Their preconceptions are weaker however, because whereas every future teacher experienced grade school and high school, future media producers have really had little experience as learners with educational media, and even less experience with its creation and production.

The third group of students is composed of those who are interested in the process of education itself, and in its operation as a social institution. Always a minority, they tend to come from other social science departments like psychology or sociology. With the fewest preconceptions, they usually find the social analysis of educational technology to be an engaging challenge.

One could compare the three groups of students with those who want primarily to learn how to drive a car, those who want to learn primarily how to make a car, and those who want to learn how and why the automobile transforms society. Each of those learnings is important, but I would propose that the latter is the most appropriate for the university students. Since teachers and media producers have professional as well as technical and operational responsibilities, the social inquiry into educational technology can help probide the background to their work, and the basis for more autonomous and ethical choices in their advanced studies and future activities.

Beyond the question of professional autonomy, however, is the fact that students are citizens in a complex society. Even if present students of educational technology never function in any future professional relationship to instructional media, they will all relate to it as inhabitants of a technological world. The examination of educational technology becomes a model from which to understand education itself, and the social order in which it occurs.

With the dramatic spread of electronic information processing and transmission, greater attention is now focussed on instructional technology than has been so in a generation. At the global political level, the training and re-training of the workforce is an issue of public discussion and ongoing importance, even though we have barely engaged the problem beyond our anxious talk. While technical displacement is a complex issue, the subissue of re-training is certainly a problem in educational technology as much as anything else. At a less pressing level of public attention, the home computer with its teaching programs alongside its video games has brought the school curriculum into the living room as never before. Students may have brought homework assignments from school for many years, but parents seldom purchased formal learning materials independently in their local toy or computer store as they do today. While this phenomenon may be restricted so far to middle and upper middle class families, it raises public attention to educational technology in new ways.

In the school themselves, computer applications and computer literacy courses have sensitized students, parents, and teachers to this new form of mediated learning. Parents' groups have pressured school boards to buy computers, or have raised money themselves to buy computers for the schools. While much of the energy is quite positive, it also reminds one of the naive enthusiasm which accompanied the spread of educational television in the 1950's. My point is not that the computer in education is or is not a panacea. No medium ever is. My point is, rather, that we have an opportunity to raise the questions of instructional communciation in a profound way. Whether in the school, the home, or the workplace, to respond to instructional challenges with good sense requires a broader and more humane sense of educational technology than if afforded by emphasis only on techniques and technical possibilities.

A historical review of instructional communication can teach as much, for instance. One may examine instructional technology from almost any time in the past, but I find it useful to begin in the late 18th Century, when the concept of a school system for mass education became the firts modern technology of instruction. Presenting such a concept attempts to move students away from the idea that instructional technology is something that plugs into the wall and lights up toward the idea that educational media and materials are a subsystem of a larger subsystem of schooling or training within a system of mass society.



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From such a viewpoint, and looking at the recent past, students may, for instance, find the progress and decline of instructional television in the 1950's and 60's very instructive when analyzing the progress of computer related learning today. While I am certainly not proposing that computers in the schools will follow the same path, I am proposing that the separation of its genuine possibilities from promotional dreams and airy visions will allow us to create a more solid foundation for the future. Naive enthusiasm, uniformed by historical awareness, can blind us to the fact that in most cases it is not magic that students are confronting, but a text on an electronic page. It remains to be seen whether the computer, coupled with the laser videodisc, can finally realize the educational and training hopes associated with the "teaching machine" of the 1960's. I am optimistic, and I would want my students to become optimistic too. But I would also want them to look back historically, and temper their unfounded certainty that we have found the answer to all our educational media problems in the computer.

Philosophical input can also inform the study of educational technology, as it informs the study of every human issue. Fundamental educational questions, such as the nature of knowledge, become more than abstract when instructional materials and programs are formulated. We recognize that there is a vast difference, for instance, between facts and knowledge. The explosive growth of information availability has sharpened our need for clarity in that distinction, and for understanding of its implications for instructional design. Logic, ethics, ends, and beginnings: these philosophical issues are as applicable to educational communication and technology as to any substantial part of life. When we bypass them, and go directly to design techniques and production procedures, we lessen the substance of our communication enterprise not only to our students but to ourselves. The fascinating power of the computer to store and manipulate questions and answers can become as intoxicating, and even addictive, as a game in a video arcade. It is in the philosophical issues that we can soberly ask what it all means, what it accomplishes, and whether it is worth the doing at all.

The fundamental questions underlying educational technology are also found in the socio-economic analysis of the creation and deployment of educational technology. The instructional enterprise costs money, whether taxes or tuition in the schools, or public or private investment in government,business and industry. If funds are to become available for the development and use of educational media, those who dispense funds must be convinced that they will have value. Since value means more than saving money, these questions are social as well as economic. In industrial training, the cost-effectiveness of instructional programs may be documented through such measures as the saving of training time or greater productivity following a new training design. In school systems, however, such measures are not available. Time and money combine with larger issues such as equal opportunity or physical accessibility to create a complex political context in which decisions about educational technology must be made.

In Canada, for instance, the educational technology of the teaching of the official languages is more dependent upon the cultural and political aspects of Canadian life than it is on learning theory or electronic equipment. Anyone who is going to work in the educational technology of language instruction, or who wishes to bring an informed understanding to it, must understand the social context in which decisions are made supporting or not supporting the development and use of particular devices or programs. Other growing issues in educational technology, such as distance education or media support for continuing education, are more affected by levels of employment, party ideologies, and budget than they are by the availability of new communication media and patterns for the design of courses and programs.

I would not want to seem to be departing too far from the concerns and perceived immediate needs which bring students to a course in instructional technology. The approach I discuss here is not simply a reaction to the student tendency to focus either too much on the immediate, whether it is grade school bulletin board lettering or the design of complex courseware, or too much on the distant, leaping into a utopian future of material and information abundance.

Neither the immediate nor the future may be disregarded, of course, and I am not trying to suggest that the immediate needs of the practicing teacher or instructional designer, or the future needs of schools, industries and society, are not worthy of attention. It is rather a question of priorities, and what will provide the most useful introduction to the entire field.

I have touched on some of the topics I deal with in examining instructional communication as a social inquiry. Let me offer a few other examples to illustrate this approach. In the 1950's, for instance, the development of the "new" science curricula and their accompanying media packages was a response in the United States to their belief that the superiority of Soviet science education led to the Soviets' early lead in the space race. It created an ambitious curriculum reform program in the USA, which changed Canadian science teaching as well. The dilution of those programs, and the disappearance of their media support packages, can be both instructive and cautionary today. In the 1960's likewise, there was an attempt to open, humanize, and individualize schooling. Sometimes extreme but



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often well grounded, those attempts failed to generate much change. Partly a problem of our social inability to accept and capitalize upon individualization in the school or the workplace, it was also a problem of not having sufficient individualized instructional media and materials - neither in quantity nor quality - to provide for learners to work on their own. It is a problem we have not solved.

Today, computer applications and computer literacy are drawing the most attention in educational technology, and deservedly so. But the same social issues which surrounded new applications and media literacy in the past are still present and equally relevant to the computer. Whether the fact that the contents of a major encyclopaedia can be stored on one chip or one disc is or is not important depends on what a school has done and will do with the same major encyclopaedia already available in the school library. The fact that clerks or sales people can learn to automate their workplace may or may not be beneficial, depending not only on what it does for the balance sheet but what it does for the workers and the people they serve. These are the ambiguities and problems we will face in every aspect of educational technology. As an introduction to instructional communication, therefore, they form a base on which to build more advanced work.

What are the difficulties in offering such a course? I have already noted that students have preconceptions, sometimes quite strong, about what a course in instructional communication should entail. Pushing against such preconceptions can be slow and tiring. Even with students who embrace social inquiry, the course calls for a fairly broad base of knowledge which one seldom finds in many students. To put it more bluntly, many students have a rather dreadful background in history and social thought. On some days, it becomes discouraging - on most days, however, it strengthens my commitment to the value of such an introductory course. If students come into the course not quite certain of when World War II ended, and what the "baby boom" and the teacher shortage of the 1950's and 60's meant for educational media, they may go out not only understanding a bit more of what educational media and technology can and cannot do, but also understanding how teacher shortages and surpluses are defined, and how population changes interact with social expectations about schooling, training, and re-training.

As a social inquiry, such a course helps fulfill the university's basic purpose of providing a general education. For each of the three groups of students, it relates their immediate concerns to the broader social background. For the teacher and trainer, social inquiry can broaden criteria for the planning and selection of media and materials. Instructional choices can be seen as validating or challenging issues such as the value of certainty or uncertainty, the priority of the individual or group, or the utility of specialized or integrated knowledge.

For media producers, social inquiry helps create a sensitivity to the variety in the educational enterprise, and the context in which it must function. It should help them relate more effectively to the teachers, trainers, and learners they serve. Whether creating instructional images, training manuals, or learning programs for school or industry, media technologists must remember that design did not start with the computer, and that learning materials serve a larger purpose than their own creative elegance.

For the third group of students, those selecting instructional communication for its general interest, the course will relate to their other studies in history, political science, economics, sociology, psychology, or any social concern. Instructional communication then serves as a microcosm of social forces, and examples of the social process in operation.

The sharing of the interests and approaches of each of these three groups of students enriches the experience of the course for them all. If students continue in further course work in instructional media or media production, the introductory course will be of obvious value. But whatever students in the early years of their university studies might imagine their futures will bring, their realities are often different. Therefore, regardless of their planned or actual careers, the learning experience should have value even it it is the only course they ever take in educational technology. As social inquiry, the teaching of instructional communication can deepen students' understanding of their own instructional environments, and can assist them to become a bit wiser as citizens who must take responsibility for education in a democratic state.



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# AMTEC '84 ... A Kaleidoscope of Media

## INTRODUCTION TO THE PRODUCTION PROCESS

Knowing media production technology, production-direction elements and techniques, or how to write a script can still leave prospective project/program leader twiddling his thumbs wondering how he can co-ordinate all these eclectic elements.

The production process described is one in which the project/program leader has the option of skipping steps or starting from the middle and working forward and backward simultaneously. However, the "freestyle" approach might not be feasible for all media productions. Program idea comes to the project/program leader with different goals. He/she in collaboration with the producer should be able to plug these diverse elements into a methodical production framework.

In this section, such a framework is established. Starting with the raw idea or concept, the framework consists of steps divided into four stages: 1. pre-production, 2. production, 3. program creation and 4. post production. Depending on the nature of the program, perhaps as many as half the steps may not be applicable. This decision, however, cannot be made until all the steps have been considered individually in terms of the current production.

The production process, like magazine production, is not substantially affected by the nature of the message. The same bases are touched in a business communication as in a variety show. Although the production chores are subdivided into project/program leader, producer, director and talent responsibilities, in practice the success of a production does not depend on who does each hob as long as the job is done and done well. The following flow chart is our production framework; the rest of this section illustrates the steps in the process.

A project/program log book should be kept up to date by either the Production Secretary (PS), the Production Assistant (PA) or the Production Manager (PM). This book contains all activities (steps), transactions, problems, resolutions . . . and dates "action" was taken. Because of the nature of production and all the activities that happen at once the "log" helps keep the production crew on track and provides important data for the final evaluation.

### A PRE-PRODUCTION

Project/Program leader and "creative" staff

1. Show* idea/concept (Metaphore**) - First draft script.
2. Content discussed and ascertained.
3. Focus and form - format chosen.
4. Talent identified.

### B PROJECT/PROGRAM LEADER, PRODUCER AND TALENT

5. Talent chosen.
6. Show* outline made; segments described.
7. Talent "fleshes out" show* outline and segments (rough content, graphics, etc.)

### C PROJECT/PROGRAM LEADER

Producer-Director-Talent Conference

8. Producer and director discuss set, graphics, equipment, crew "taping" date and time.
9. Producer, director and talent go over developed show* outline (script) and relate it to set and graphics Final script.
10. Producer, director and talent firm up format and show* elements.
11. Producer and director divide production tasks.

### D PRODUCTION

Producer

12. Arranges for acquisition or creation of set and graphics.
13. Develops show* with talent: set, graphics, firmer content.
14. Arranges location/studio time, equipment, and crew.
15. Arranges for basic sound and lighting.
16. Producer and director discuss firm show* format, checking for changes, additions, and problems.
17. Goes over final form of show* with talent.
18. Prepares shooting script.
19. "Blocks" show* for cameras and crew. Develops "shot sheets" for each camera (if applicable).



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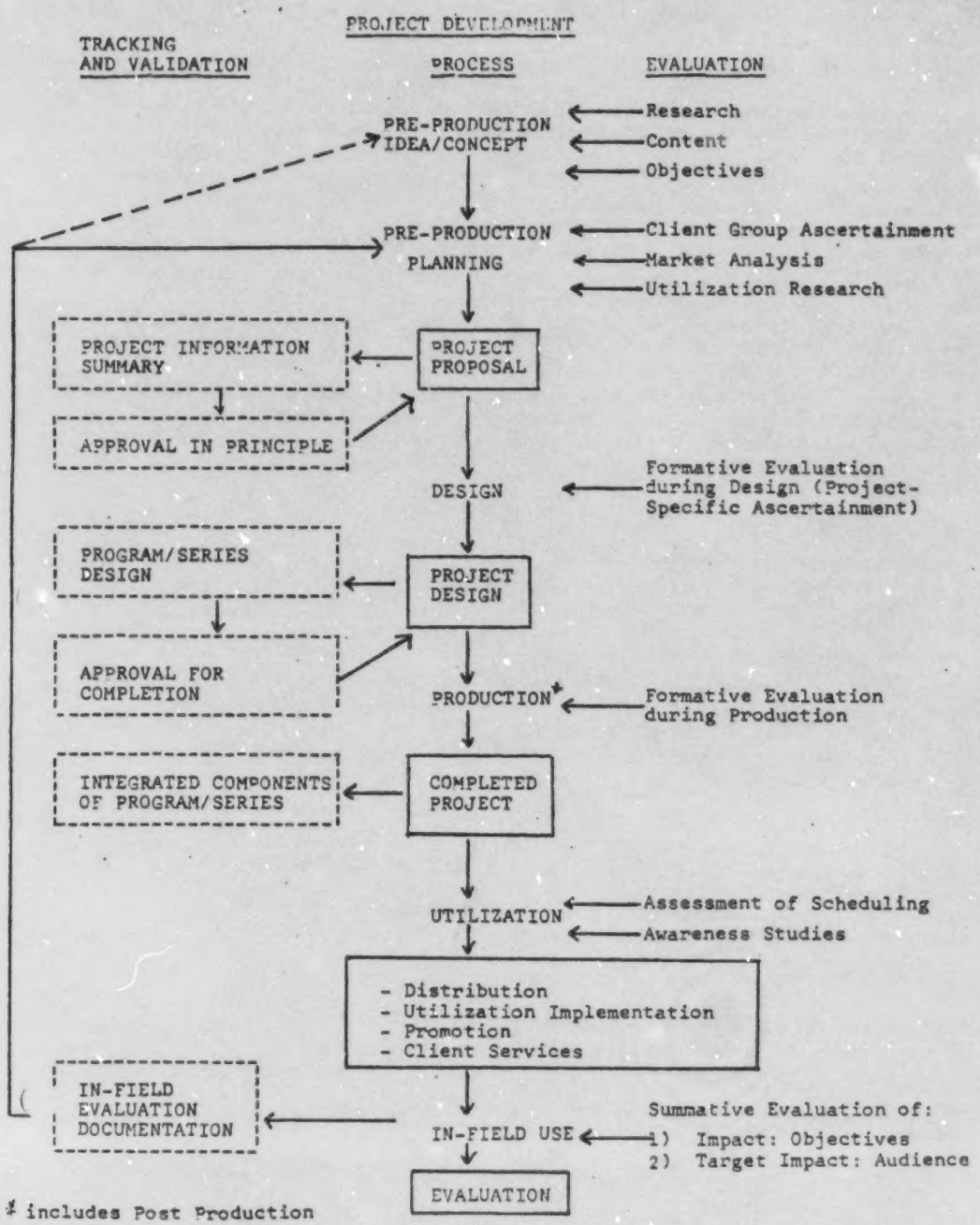
PROJECT DEVELOPMENT
TRACKING AND VALIDATION
PROCESS
EVALUATION
PRE-PRODUCTION IDEA/CONCEPT
Research
Content
Objectives
PRE-PRODUCTION PLANNING
Client Group Ascertainment
Market Analysis
Utilization Research
PROJECT INFORMATION SUMMARY
PROJECT PROPOSAL
APPROVAL IN PRINCIPLE
DESIGN
Formative Evaluation during Design (Project-Specific Ascertainment)
PROGRAM/SERIES DESIGN
PROJECT DESIGN
APPROVAL FOR COMPLETION
PRODUCTION*
Formative Evaluation during Production
INTEGRATED COMPONENTS OF PROGRAM/SERIES
COMPLETED PROJECT
UTILIZATION
Assessment of Scheduling
Awareness Studies
- Distribution
- Utilization Implementation
- Promotion
- Client Services
IN-FIELD EVALUATION DOCUMENTATION
IN-FIELD USE
Summative Evaluation of:
1) Impact: Objectives
2) Target Impact: Audience
EVALUATION
* includes Post Production



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E PROGRAM CREATION (InStudio or on location)

Producer

20. Arranges for all outside materials (graphics, etc.) and talent to be at "taping".

Director

21. Readies all in-studio and on location materials, equipment and crew for "taping".
22. Sets up set, lighting, and sound (with stand-in or talent). Gives "shot sheets" to cameramen.

Producer

23. Producer in the studio and/or on location.

Director

24. Runs through show* with talent and graphics.

Producer & Director

25. Test tape made and evaluated for light, sound, talent coordination. Changes or corrections made.
26. The show* is taped.
27. Replay evaluated.

F POST PRODUCTION

28. Editing - mixing - special effects.
29. Delivery - completion of paper work.
30. Evaluation.

The project/program leader acts as a co-ordinator or facilatator. He or she may also be involved at another stage of the production.

*Show: Program, film, multi-media presentation
**Figure of speech in which a word or phrase is applied to an object or action that it does not literally denote.

## GUIDELINES: PROGRAM DESIGN

A. Introduction

A project/program is composed of a comprehensive set of integrated activities relating to clearly defined objectives to be fulfilled. The process by which these activities are accomplished is called the Project/Program Design.

Project/program leader, managers and producer/directors are encouraged to use these Guidelines in the devlopment of project/program proposals and designs. The project/program leader (or designate) is responsible for developing the Project/pgogram design and ensuring the relationship of the project/program to accertained market needs, industry and corporate criteria.

The process presented is not a formula that ensures success, rather, the process described is an ideal, or a base upon which a Project/Program Leader can build the ultimate system. What is important, is that Project/Program design be a collaborative process. Defining understanding and capitalizing on all human and financial resources will enhance the "quality" of your project/program.

B. Guidelines for Project/Program Ideas Proposals

The project/program ideas proposal is the preliminary document required in the planning process by many funders (Broadcasters, media agencies, funding groups . . .) The proposal should be submitted to the appropriate authorities when requested in a comprehensive but summarized format.

The elements that should be considered for this proposal are:

1. Need/Ascertainment:
   - why the project is needed/would be useful.
   - identification of the client group
     - funders/agencies
     - audience/who will see the completed program
   - what medium should be used
   - how were the needs determined
     - internal sources/the "funders" - external sources/the "industry"



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2. Project/Program "Educational" Objectives
   - statement of purpose or goal
     benefits to who - funders
     - audience
   - anticipated outcomes
     - increased knowledge
     - motivation, attitude change . . .
3. Project/Program Description
   a) Concept
      - what the project will (is intended to) accomplish
      - subject area and content to be presented
      - project/program metaphore - "Story line"
   b) Format
      - mode of presentation
      - components proposed: TV, print, audio, interactive, etc.
      - the role of the chosen medium in the project/program design
4. Project Materials
   - anticipated type and format
   - mode of utilization (relationship to components)
5. Utilization Design/Follow-up
   - mode of utilization intended
   - specialized utilization needs: pre-or post-broadcast workshops, study groups, etc.
6. Information/Promotion
   - anticipated release date
   - specialized information/promotion requirements
7. R & P - Formative/Summative
   - anticipated research and planning needs: pre-production and during production
   - how the project should be evaluated: audience "share", target impact, cost effectiveness, etc.

## TELEVISION: A DISTORTED VIEW

by Patricia A. Dolan Lewis
Richard F. Lewis

". . . Some children could be damned by exposure to television. Those that could be 'saved' were those who enjoyed the WASP world of love, security and middle-class values." (Lowery and Defleur, 1983).

This statement provides dramatic insight into the cultural rigidity inherent in the impact of television on children. It also implies that television can influence children in their learning, valuing, believing and behaving. This paper will examine the complex interconnections between television effects and culture. It will consider the impact of television on learning - cognitively, affectively and behaviorally. Then it will relate this learning to current televised material about other cultures.

### Impact of Television

Bogatz and Ball (1970) showed that children can learn academic information and skills from Sesame Street. Other studies confirmed the fact that television is a source of cignitive information (Alper and Leidy, 1970; Chaffee, Ward and Tipton, 1970; Chu and Schramm, 1967; Hawkind, Pingree and Roberts (1975). In these studies information as diverse as the U.S. Constitution, drugs, politics, Watergate and the Vietnam War was provided by television. After exposure to specific programs, young people showed increased knowledge of the screen content. Lyle (1978) concluded that television is an immensely potent factor in American life because it fills knowledge gaps. From these and many more diverse studies, it seems reasonable to conclude that television can influence cognitive development.



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## Incidental Learning

Further research on learning from television indicates that learning occurs even when the program is designed to entertain. According to Schramm, Lyle and Parker incidental learning is "learning that takes place when a viewer goes to television for entertainment and stores up certain items of information without seeking them" (Lowery and DeFleur, 1983, p. 75). Studies investigating incidental learning indicate that young people can acquire information both essential and incidental to the televised plot (Hawkins, 1973; Leifer, et al., 1971; Baran, Chase, Courtright, 1979). Incidental learning from television is not restricted to cognitive information but it can overlap into the affective and behavioral domains.

Within the context of this paper, the information presented by television in the area of affective incidental information will be closely examined. This information refers to the material presented on the awareness of attitudes, acceptance of values, preference for a value, conceptualization of a value with particular reference to material presented on other cultures and peoples. Often, within entertainment shows, the background material of the plot is very strong in affective incidental messages about people's lifestyles, traditions, cultures. It is this material which will be considered.

Televised entertainment shows can contribute to young people's vision of the world around them. This learning - termed social reality learning by many researchers - has been more closely examined in recent years. The work by Gerbner and Gross (1976) provided the foundation for the cultivation hypothesis which suggests that heavy television viewers may have distorted views of violence and interpersonal mistrust. This work has been expanded by other researchers to link young people's vision of society and their definition of culture to what television promotes in its programming.

## Behavioral and Affective Learning

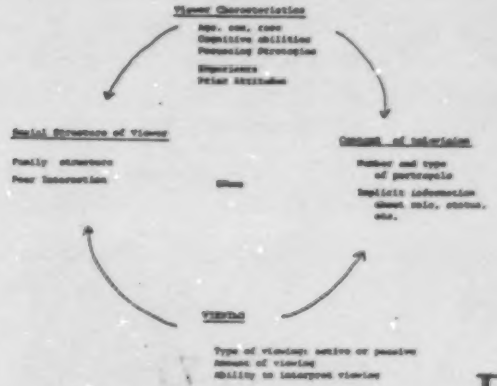
Further studies have demonstrated that a young child can alter or acquire behavior by observing television. Based on Bandura's social learning theory, these studies demonstrated that child can learn a wide variety of behavior from television: aggression, cooperation, sharing, and affection. Stein and Frederick (1972) show that a child can increase prosocial behavior such as helping, cooperation, and sharing by watching "Mr. Roger's Neighborhood." Baran, Chase and Courtright (1979) revealed that subjects exposed to "The Walton's" displayed greater cooperative behavior than subjects who didn't view the program.

## Model for Understanding TV's Impact

What exactly a child learns from television - whether congitively, affectively or behaviorally - depends on the age, sex, race, cognitive abilities, social environment, and personal experience of the child. These characteristics have been further defined into more precise factors which seem to affect television's impact. See Figure 1.

Cognitive learning can be influenced by a child's focussing strategies, ability to make inferences and level of abstract or concrete learning. Studies have determined that a child's ability to find order in isolated events and to comprehend events and relationships in a plot - his focussing strategies - will influence what a child learns. Age is closely connected to focussing strategies because older children seem better able to find order in different events. As a result, older children may seem less susceptible to incidental information within a television show because they are able to understand the plot. Younger children, in contrast, often remember the details of the program and forget or misunderstand the show's theme.

Figure 1:
Model for Considering Impact of Television on Child's Social Reality



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Inference making is another set of skills which influences the child's learning from television. Children who are able to put together widely separated facts and draw conclusions from these facts seem less influneced by television. Age is again closely connected to inference making, because older children are usually better at drawing inferences than younger children. (Pingree, 1983).

Emphasis on the concrete can also effect learning from television. Younger children often depend on concrete objects for information. As a result, younger children may attend to different things from television. This fact is central to understanding what children can learn about their social reality from television. Information in television programs about the world is often only incidental to the story; it be implicit rather then explicit in the plot. The sex, age, occupations, status and traditions of a people is usually implied through complex codes of dress, role and status within the program. For a child watching television and learning from television will be intimately connected to the child's level of cognitive development.

Social Development and Experience

The family and social experience of the child will also have direct impact on what a child learns from television. Corder-Bolz (1980) demonstrated in his work that children will believe more of what television teaches, if the child's environment is lacking in information. He laso indicated that adult interaction about the televised material has significant impact on what a child learns from the television. If the real world confirms the television message, the child has a stronger likelihood of believing the material. If the real world, disconfirms the material, the child has a stronger likelihood of disbelieving it.

Gross and Morgan outlined four characteristics of family which assist or hinder television's impact. First, regulation by parents of children's viewing can reduce the amount of cultivation through television. Second, parental views of the usefulness and reality of television will influence a child's acceptance of televised information. If parents have a low view of the utility of television, then television's influence is reduced. Conflict over viewing and independent access to television are also related to television's impact (in press).

Group support, peer pressure and alternative sources of information all affect television's impact on the child. Hawkins and Pingree (1981) indicate that children with strong pper group structu res seem less influ nced by television than solitary children. More sources of information also seem to have limiting effects on television's influence.

This brief review of the impact of television on children indicates that children can learn from television, but that children learn differently depending on their cognitive development, social and personal experience. To understand how differential learning from television may influence a child's vision of social reality, it becomes essential to understand what the television is projecting about the world - particularly the world of multicultural Canada.

Culture and Learning

In recent years, researchers have more closely analyzed the content of television shows in order to accurately understand the cultural reality presented.

According to Churchill and Moschis (1979) television provides information on materialistic values, consumer learning and the social motivation for consumption. This cultural view is, obviously, one-sided and reflects the dominance of the time-centered industrial culture.

Another critic of television, Stern (1979) comments on television's homogenized, hygenic world. In this review, television is considered reflective of the locale and culture of Los Angeles, California. The values emphasized are superficial: physical beauty, pleasantness and financial success. The themes which television emphasizes are money and opportunity.

Both of these critics have commented on the overall cultural milieu of television. In more specific studies, critics have considered th quality and quantity of television's portrayal of minority groups and culture.

Content Analysis of Canadian Television

Two studies have dealt primarily with Canadian television and the presentation of minority peoples. The PEAC (1980) study concluded that television is primarily a white man's medium. Sixty-nine percent of the characters on television were found to be male and 90.4 of these men where white, according to the PEAC report.

The most recent Canadian analysis (Granzberg 1984) concluded that portrayals of culturally different people are often stereotyped, discrimnatory and misrepresentative. In this study of CBC, CTV and CBS prime-time television, Granzberg modified Gerbner's cultivation index to measure misrepresentation of visible minorities and stereotyping.



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He concluded that television tends to present different cultural groups in ways which contrast to reality.

Granzberg's study discovered that culturally different people are not provided with equal opportunity to appear on television as participants in the 'good life' Status of employment, lifestyle, income and heroics are usually lower for a visibly different person. The actual lifestyle of TV minorities is also in contradiction to the lifestyle of real minority persons, particularly in the areas of marriage, residence and presence in the population. Overall, Granzberg discovered that the presentation of minority groups was often hindered by romantic imagery, lack of appreciation of the inner rationality of ethnic customs and undifferentiated portrayals of persons (1984). The findings in this study did vary between stations. The American CBS network ranked the highest in discrimination, stereotyping and lack of ethnic appreciation. CBC ranked lowest in CTV placed somewhere in between the other two stations (Granzberg, 1984).

American Studies

The Americans have done many different content analyses on the presentation of minority people on television (Greenberg, 1980 and U.S. Commission of Civil Rights, 1977). These studies reinforce the fact that television tends to present a very biased view of society. When minority people are presented, the information is often erroneous.

Consider, for example, that studies have shown that American Indians are most often shown on television as marauders, murders. inept fighters or stupid savages (Morris, 1982). Asian Americans are often shown on television as villians who use technological or psychological power to achieve their ends (Liyama and Kitano, 1982). Black Americans according to studies by Greenberg and Baptista-Fernendez (1980) are usually shown on television as younger, leaner, funnier and flashier than their white counterparts.

This review of the current image of culturally different people on television provides a limited understanding of the information available to children about minority cultures. To understand the impact of this information, it is necessary to consider that children often have limited contact with members of other cultural groups in their early years. The television, then, may be one of the primary information sources for information about cultures and peoples which differ from the child's individual heritage.

Today, television occupies a prominent position in the socialization process of a child. It serves to transmit the society's culture and it assists in molding the culture. The impact of television is therefore more intensive and all pervasive in attitude formation and value making than was formerly recognized.

Response to Current Programming

Assuming that current television programming will not alter dramatically within the next year, it becomes important to consider alternative approaches to receiving the televised messages. Critical viewing courses have demonstrated effectiveness in teaching children to view television more analytically. The skills taught in critical viewing courses - the techniques of comparison - contrast, analysis and synthesis, and critical observation - are applicable to viewing television from a multicultural perspective. The questions which the students are asked may be different, the episodes viewed may be different, the materials reviewed may be different, but the fundamental process remains the same. Students and teachers will view the television as participants in programming rather than passive receivers of entertainment. They will apply the critical thinking skills taught in other subject areas to the material presented on the tube and make some comparisons to their individual social reality. This process could provide both students, teachers and television programmers with a more accurate vision of their community and country.

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## EDUCATIONAL TECHNOLOGY: ART OR SCIENCE?

by
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What does it really mean when we say that educational technology is an art? or a science? This paper will explore the implications of the two metaphors in terms of educational technology research and practice. It will begin with an examination of the basic concepts, followed by a theoretic analysis of what happens when educational technology is considered within each of the metaphors.

The perspective of the author is that both have a significant role to play in constructing a total theory of educational technology. Durrently there appears to be a scientific bias which as worst distorts wheat educational technology can offer. At best, educational technology is a rich concept, firmly grounded within both aesthetic and scientific models. This paper will attempt to provide an initial analysis of educational technology, within these perspectives.

### 1. THE PIECES OF THE PUZZLE

This paper is about educational technology, art and science. Note that when we say educational technology, there is no alternative term called "educational art" or "educational science." Indeed, it may be somewhat of a paradox to try to claim that what is labeled a "technology" should be discussed as an "art", or as a "science." Perhaps the way out it to suggest that the purpose of this paper is to examine art and science as metaphors for educational technology.



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# AMTEC '84 ... A Kaleidoscope of Media

When we use the term metaphor, we are speaking aesthetically rather than practicallt. To most of us, the simplistic definition of a metaphor is that of a literary comparison. But metaphors are indeed a far richer concept. Metaphors are techniques of representing the universe, similar to analogy or model. For the purposes of this paper we will not delve into the complexities of metaphor, but rather borrow from Lakoff & Johnson (1980 that "our ordinary conceptual system, in terms of which we both think and act, is fundamentally metaphoric in nature."

Let me set the stage by placing before you a few pieces to a jigsaw puzzle. The first piece suggests that we live in a world of science. We tell our children today that to get ahead, what is necessary is to learn the sciences: mathematics, physics, chemistry, and especially computer science. The arts are perceived as extras, add ons, frills. Except perhaps for reading, the arts are not normally considered part of the basics.

The root for this scientific shift in education is often atrributed to the first Soviet Sputnik launch, an event which caught the western world, particularly the USA off guard. Today a scientific mood permeates society.

Education, too, is often assumed to be better off, if treated as a science, rather than as an art. Educational technology is considered almost exclusively a scientific approach to instructional development. Thus, an American instructional developer can write with overconfidence and unintended bias: "Over the years, that I've been doing whatever it is that we do, I have noted an alarming and accelerating movement away from the "applied science" direction and towards the softer "arts and crafts" end of the continuum."

The second piece of the puzzle illustrates a common perception others have of educational technologists. As I have written elsewhere: Educational technologists are typically perceived of as cold, mechanistic, interested in boxes and arrows, behavioristic, gadget lovers. We are perceived as dehumanizers of learning. Our scientific and technological orientation leaves us open for inevitable criticism.

The third piece of the puzzle suggests a paradox. It seems that entertainment technologies of film, TV and radio, have tended towards a popular culture/aesthetic dimension. Instructional technologies on the other hand, have tended towards a scientific dimension. Once in a long while the two are united and we have a film, or television program which is pronounced both educational and entertaining. Perhaps there is a clue in this.

There is yet a fourt piece of the puzzle, evident in our history of educational technology. The current view is that, in fact their are two educational technologies. To paraphrase historian Paul Saettler (1968), the first is the application of tools to education, the second is the application of behavioral sciences. Note that, in fact one is a technological model, the other a scientific one. Other writers have referred to a difference between a technology of education vs a technology in education. And Salomon (1973) has suggested a similar dichotomy, suggesting that educational technology is "either the application of tools, or the application of learning theory . . . the alleged underlying basic sicence of education . . . to the problems of media. The significant point here is that even though each author suggests that there is a dichotomous split, both of their "opitons" are science-based options. There is no room . . . indeed apparently no thought . . . of an aesthetic conception of educational technology within these frameworks.

Saettler (1979) somewhat later modifies his view and defines educational technology as "the systematic application of the knowledge of the behavioral sciences or other relevant knowledge (ie. insights and implications flowing from the humanities and/or the arts to the problems of learning and instruction." Unfortunately, Saettler fails to develop further these ideas, but continues in his traditional science based mode.

Only Ivor Davies provides room for an additional conception of educational technology which he describes via not two, but three metaphors: a tools or audiovisual approach; an engineering or systematic approach and a Gestalt, artistic, or systemic approach.

To summarize so far: The problem which I am attempting to explicate, is that an unintentional scientific bias exists which distorts the way we perceive, use, and research educational technology. Now, if education is a science and we use scientific methods to study it, then that is reasonable. But what if education is essentially an art? And what if we are using scientific methods to study that art? To answer these questions, we need to first distinguish between "art" and "science", at least in an educational context (since in a more general sense the conflict of the Two Cultures has been well documented).

What appears to be needed is, not a swing of the pendulum back to an aesthetic approach, but rather a balanced view, in which both art and science have a place. "It is to the artistic to which we must turn, not as a rejection of the scientific, but because with both, we can achieve binocular vision. Looking through one eye never did provide much depth of field." Eisner, 1981) Possibly even a multi-focal view. (Hlynka & Nelson, in Press.)



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This is not to say that the potential of the aesthetic domain has never been considered a component of educational technology. For example, in May of 1983, I was on a consulting job in India with a group of Canadians, and we came prepared to show off our technology and science, relevant to education, and I confess that I was greatly impressed when the Indians told us that that was only partly what they wanted. One speaker, Prof. Biday, pointed to "the failure of imagination in the teaching community." as a reason for the failure of educational technology. And Dr. Shah of the Indian University Grants Commission opened the conference by telling us:

> "What we would like to learn . . . is how do we go about the preparation of software which will grip the poeple. How do we develop dynamic software. . ."

It is precisely that question which moves us away from the domain of science and technology as a base for educational technology, towards the world of craft and art. That topic is precisely the content of the next section

## 2. ART AND SCIENCE

In order to explore the aesthetic implications for educational technology, this section will back up, as it were, to examine the domains of art and science, what they do, and how they do it.

Snellbecker (1974) provides some working definitions from which we can begin to question scientific and aesthetic metaphors of educational technology. Ultimately we will need to examine whether the scientific and aesthetic conceptions of educational technology actually exist, and if so, whether they are mutually exclusive or complimentary. ART, says Snellbecker, typically refers to some practice that requires a great deal of personal judgement . . . determined by appropriateness in a practical situation. The keywords in such a definition are intuition, creativity, and judgement. It might be noted that this definition of art assumes that we are considering practical arts, rather than the fine arts, although an argument might also be made for the same characteristics . . . intuition, judgement, and creativity . . . as being the hallmark of the fine arts as well. Nevertheless, as Gage (1978) puts it, "Teaching is, of course, a useful, or practical, art rather than one dedicated to the creation of beauty and the evocation of aesthetic pleasure as ends in themselves." (p. 15)

SCIENCE refers to a specific body of knowledge which focuses on a distinct set of constructs and principles which has been empirically validated.

TECHNOLOGY is the application of scientific principles to a practical situation.

A cursory examination of these tentative definitions probably suggests that educational technology contains elements of all three . . . art, science, and technology. To assist us in exploring WHEN educational technology is an art, and when it is a science, it is necessary to examine the purposes and procedures of art and science.

The first point to be made here is that the goal of both is often the same . . . revelation of truth. The school book definition of fiction as "a story that is not ture", is not only simplistic, it is downright wrong. The artist believes that he is simply presenting a different approach to truth. It was D.H. Lawrence who once wrote that "Being a novelist, I consider myself superior to the saint, the scientist, the philosopher, and the poet."

Joseph Conrad, in his classic introduction to his novel The Nigger of the Narcissus, explained "My task which I am trying to achieve is, by the power of the written word to make you hear, to make you feel . . . it is before all, to make you see."

And, to return to education, art educator Elliot Eisner asks, "Surely there needs to be a place for metaphor, poetic statement, the non-operational comment or insight, the descriptive assertion that one cannot measure. Why should we limit ourselves to one mode of discourse? Where is it prescribed that scientific propositions and logical analyses are the only way to express what educators have experienced?"

Scientists, too, have flet this same need. Paul Feyerabend (1975) has suggested that scientific edcision making is very similar to aesthetic appreciation. In what he calls an "anarchistic theory of knowledge", he writes that" . . . it is possible to retain what one might call the freedom of artistic creation and to use it to the full, not just as a road of escape but as a necessary means for discovering and perhaps even changing the features of the world we live in. (p. 52). And again: "We arrive at the result that the separation of science and non-science is not only artificial but also detrimental to the advancement of knowledge. If we want to understand nature, if we want to master our physical surroundings, then we must use ALL ideas, ALL methods, and not just a small selection of them. (p. 306)"



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On a less radical dimension, Gage (1978) explores the role of art in teaching:

> Scientific method can contribute relationships between variables taken two at a time and even, in the form of interactions, three or perhaps four or more at a time. Beyond say four, the usefulness of what science can give the teacher begins to weaken...At this point, the teacher as artist must step in and make clinical, or artistic, judgements about the best ways to teach. In short, the scientific base for the art of teaching will consist of two-variable relationships and lower order interactions. The higher-order interactions between four and more variables must be handled by the teacher as artist." (p. 20).

What then do artists and scientists do? How do they perceive the world differently? Flemming (1973) suggests the following five points of comparison.

1. "The scientist . . . is concerned principally with the problem of analysing; while the method of the artist is primarily synthesizing." The educational technologist as scientist, then is primarily concerned with being able to analyze an educational situation. He talks about taks analyses, audience analysis, writing of carefully planned behavioral objectives as the tools of his trade. The educational technologist-as-artist is concerned with putting together, synthesizing the results of such analyses into a coherent meaningful whole.
2. "The scientist deals with the objective world of facts and phenomena; the artist with the subjective world of imagery and feeling." A teacher, surely needs both. Facts without emotion are exemplified by the Mr. Grandgrind character in Charles Dicken's HARD TIMES. Mr. Grandgring is indeed an appropriate example, representing for many literary scholars the epitome of technological man at his worst.
3. "A scientist attempts to evolve general laws applicable in all cases; The artist explores individual reactions and focuses upon the unique qualities of experiences." In educational technology, we become generalists in our search for the one best medium, or for the "ultimate" instructional design model. As artists, on the other hand, we assume that any medium or model can do the job, and look to other factors to make significant difference.
4. "Scientists tend to become specialists. Artists tend to become genralists, to provide a world view." This explains why good art is valid, whatever its specific origins. It is that very generalizability of Don Quixote that makes its specific Spanish-isms irrelevant, but its overriding concerns very much relevant, even 300 years after its writing.
5. "A scientific theory is tentative. A work of art stands as a final statement for all time. Art may be destroyed, superceeded, but not (like science) disproved." The concept of progress in art (See Gablik) is very different from the concept of progress in science. In science and technology, progress obsoletes what has gone before. In art this is never the case. Precisely for this reason do we accept the Venus de Milo as a statue without an arm. No one would have the presumption to try to recreate the original intent of the artist.

The point has direct relevance for educational technologists. A teacher operating under the science paradigm is probably never satisfied. Each lesson can only be improved. A teacher-as-artist accepts the view that each lesson stands and fails by itself . . . a complete statement.

## C. FUTURE DIRECTIONS FOR EDUCATIONAL TECHNOLOGY

Gage (1978) writes that "teaching as an art can become the object of the same kind of perceptive scholarship that is devoted to other art forms." The final question that confronts us in this paper is Where do we go from here? What are some of those areas of "perceptive scholarship" which might illuminate the domain of educational technology? We shall suggest five.

1. Educational connoisseurship. Elliot Eisner is the pre-eminent motivator behind the Connoisseurship model, in which he suggests that the same concepts of art criticism applied to art forms can also be applied to the classroom. The result of such an approach would, it is claimed, focus education in a more wholistic and humanistic direction. In educational technology, a practical adaptation of Eisner, at least indirectly, is the adaptation of film criticism theory applied to the evaluation of microcouseware programs in the so called MICROSIFT program. Writes Della-Piana (1980) explains that "The function of this kind of criticism...argues that what is most needed today, what is most liberating, is to make works of art transparent, to help us see how they are what they are. The argument is that to give a final interpretation, paraphrase, or summary or judgement of a work puts an end to it. It makes our own response unnecessary. It does our thinking and feeling for us." p. 12

   In general, more work is needed along this direction to allow us precisely that opportunity: to perceive underlying structures within educational technology. Mann (1968) and Willis (1978) provide the useful conceptual background for such exploration.



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2. Naturalistic and Qualitative Research Paradigms. Guba (1982) and Smith (1980) have recently explored alternative paradigms which offer different insights from the quantitative approaches so prominent today. Willis (1978), Bogdan & Biklen (1982) and Maanen et.al. (1982) offer methodological and philosophic perspectives which should be examined carefully by educational technologists.

3. Semiotics. Semiotics is a relatively new communications approach often called the "science of signs". The word science notwithstanding, the paradigm is essentially grounded in linguistics, philosophy, and literary criticism, primarily as evidenced by the work of Saussure, Pierce, Barthes, and Piagot. Its proponents point to its usefulness to explore how media communicate, by treating those media as languages. Most recently, Cassidy (1982) has explored ways in which educational technology might integrate the semiotic approach.

4. Philosophy. There is no clearly articulated philosophy of educational technology. Today, in a world often dubbed the "information society", with technology pushing the man-machine dichotomy to the limit, and with a firm philosophy of technology reasonably well established, the time for such a philosophy of educational technology is badly overdue. Probably the most useful models of how to do educational philosophy are to be found in Soltis (1968) and Green (1971). These approaches represent a fruitful field for educational technologists to explore in the next decade.

5. History. The history of educational technology has been explored but little. Were it not for the pioneering work of Paul Saettler, we would virtually have no systematic attempt to record the history of our field. More histories, and new approaches to the history of educational technology are in order.

## CONCLUSION

Is all of the above discussion merely a "tempest in a teapot"? Let me conclude with a verse from Lewis Carroll's Hunting of the Shark.

"He bought a large map representing the sea,
Without the least vestige of land.
And the crew were much pleased
When they found it to be
A map they could all understand.

Educational technology is in danger of floating in that same uncharted sea. One oar alone will bias us in the direction of science. The second oar will send us towards the arts. But by using both oars judiciously, art and science, perhaps we can amange to travel in a logical direction.

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## DUET: FROM A PILOT TO A REALITY

It was 1982 when Mount Saint Vincent University made a first awkward step into the world of Distance Education technology. The project was a pilot in live interactive television - a project which has evolved into DUET, Distance University Education via Television. DUET now services an audience stretching across a 36,000 square mile area and 5 provinces with two satellite broadcast programs. A local cable broadcast in the Halifax metropolitan area brings DUET to a population of approximately 250,000 with additional business and social science courses.



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The 1982 Pilot Project was co-sponsored by Maritime Telephone and Telegraph and Mount Saint Vincent University. It was a one way video, two way audio live interactive broadcast of University lectures to three locations off-campus. Students watched the lecture on television and interacted with the lecturer and on-campus students by telephone. The experiment was conducted over four months or one academic term.

The three pariticpating receiving centres were the Bedford United Church in Bedford, Maritime Centre (downtown Halifax) and Moirs, Lowney Ltd. (Dartmouth). All centres allowed non-employees to purticipate. A total of eighteen students enrolled in off-campus courses. Enrollments were spread across seven courses: Introduction to Public Relations (six registrants), English 120 (five registrants), Business 309 (three registrants), Business 313 (one registrant), Psychology/Gerontology 220 (three registrants), Secretarial Studies 231 (one registrant), Secretarial Studies 240 (one registrant).

Assignments were exchanged by a regularly scheduled courier service; tests were taken at receiving centres under the watchful eye of an approved proctor and exams were taken at the university. The broadcast system for the pilot project was station to station microwave while the classroom technology consisted of the following:

1. a black and white camera suspended from the ceiling at the back of a twenty-eight seat amphitheatre which was fixed on a wide shot of the classroom,
2. an overhead projector and screen and a colour camera focused on this screen
3. a lavalier microphone to pick up the lecturer's voice
4. two omni-directional microphones suspended from the ceiling to pick up the boices of on-campus students
5. a telephone with one "extension" and 3 terminating connections to the dedicated phone lines (no dialing necessary) of the receiving centres. The bell on the telephone was disconnected and if a call came in from off-campus student's a light would flash on the theiphone desk set. Once acknowledged, the student's voice would be heard over a hexagonal speaker located at the front of the classroom.

An evaluation of the project was commissioned by the university and a university committee was established to liaise with the evaluator and oversee project development. The Lewis report was the ultimate outcome of the evaluation.

The original intent of the evaluation was to measure the success of failure of the project in meeting its objectives as described below:

> "1) To demonstrate the paedagogical effectiveness of interactional instructional television as a distance education delivery method that is, at the same time, appropriate to needs of Nova Scotia and cost effective.
> 2) To demonstrate the usefulness of interactional instructional television as a human resource development strategy in business and industry.
> 3) To demonstrate the capability of existing and operational technology to link universities and industry for the purpose of delivering univseristy-level programming." [1]

As the number of registrations was small, it became difficult to make reliable statements regardind any of the objectives. Both the evaluation and the Pilot Project itself did, however, prove extremely useful in identifying overall system weaknesses and strengths.

One of the weakest elements of the pilot project was the transmission system (a station to station microwave broadcast). Over 30% of class time was affected by some form of technical problem [2] ranging from complete loss of the visual, the audio or both elements, to distracting hums, poor quality visual reproductions, etc. These technical flaws led to frustration and anxiety on the parts of faculty and students alike. When problems occurred faculty had to contact the Mount Saint Vincent University technician themselves. The reasons for these problems varied from faulty parts, to dishes blown off course by strong winds, to interference caused by snow, to problems associated with extreme cold. An alternate transmission system, a system that could be relied upon, had to be found.

A second major problem identified in the Lewis report was the classroom design and technical support system.[3] When a technical problem arose, the lecturer was left alone to grapple with it or was forced to interrupt the class to call a technician. Technical problems were not infrequent - notes made on the black board, it was discovered, were impossible to see in the off campus receiving centres. The image of the camera fixed on the overhead projector became progressively worse. Comments of off-campus students could not be heard clearly by on-campus students.

[1] Richard f. Lewis, "The Evaluation of the Mount Saint Vincent Univeristy Interactive Instructional Television Project." p. 1

[2] Lewis, p. 68.

[3] Ibid., pp. 64 - 66.



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Lecturers were limited in their movements around the classroom because the main camera was unmanned and was left on a shot that included only the blackboard and desk area. On-campus students could not be seen and often could not be heard by the off-campus students. Off-campus students could not be heard clearly by on-campus students. Telecini of films slides and video tapes were not incorporated into the system. In short, faculty members were forced to divide their attention between the technical (changing cameras, watching the phone, and compensating for transmission problems ) and their lectures. The technology was a conscious burden.

Inadequate training and consequent anxiety compounded the technical problems. [4] Faculty had received one brief training session from a media specialist and understood the basic "how to" of the classroom operations but did not feel comfortalbe. Throughout the project they were called or visited by the project manager but because of system limitations were never entirely satisfied.

The pilot project also helped to define some positive elements of the system. 92% of students surveyed, for example, felt that the visual element of a course was very important. [5] This has been confirmed by a subsequent 1983 survey where 43 out of 48 respondents felt it was important. [6] As a result DUET improved and developed the visual element of the boradcasts making it very easy for faculty to incroporate visual aides into their lectures.

The interactive element was also identified as a positive aspect of the system. The Lewis report had this to say:

> "Students expressed a desire to communicate with other students and with the professor and to be able to interrupt classroom proceedings when they had to ask a question. For most, the notion of discussing issues with other students and with the professors was an important aspect of university courses." [7]

These results reinforce the main precepts of Interactional Instructional Television i.e. both the visual element and the interactive element are important to the learner.

The value of receiving centres where students could gather was alluded to in the evaluation as is illustrated by the following quote from a student:

> "... I think if you're used to going to school and you have that feeling that you need your other students around you to talk to and discuss the course and discuss tests or whatever..."

The learning centres seem to encourage the formation of a cohesive learning team. The smaller size of the group (rarely more than eight) may have the effect of encouraging more of the mutual support and development found in the on-campus classroom. We must undertake more study in this area.

Not surprisingly, some people found independent study to be a preferable alternative to participating in groups. One student quoted in the Lewis Report said,

> "Well, in my case, I was by myself so it wasn't very hard to concentrate on the video screen and sound. I found it good because I had a lot of quiet."

This individual preference is, not surprisingly, evident in the experiences of other universities.

The Lewis Report revealed that students felt the program was cost and time efficient (a small charge for courier was added on to their regular tuition). [10]

Convenience and increased accessibility to higher education was consistantly quoted as an advantage to interactive instructional television. Many students found it difficult, some found it impossible, to attend evening courses at the local universities. Despite project difficulties with the mechanics, many students expressed interest in taking more courses via interactive instructional television. [11]

This was the encouragement Mount Saint Vincent University needed to continue to explore the potential of the medium. The first step in the world of educational technology was awkward; there were many difficulties to overcome but it did fulfil a need.

4 Ibid., pp. 69 - 71.
5 Ibid., p. 47.
6 Dr. Diana Carl, "Report of the June, 1983 Survey of DUET Courses Offered Winter and First Summer, 1983." p. 3
7 Lewis, p. 43
8 Ibid., p. 52
9 Ibid., p. 51
10 Ibid., p. 51
11 Ibid., p. 59



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In January of 1983, DUET, Distance University Education via Television was born. Many of the problems identified in the pilot project were addressed in the development of this new program. Improving the delivery system was the first priority. Negotiations began in the summer of 1982 with the provincial Department of Education and local cable companies to gain the use of the cable channel set aside for educational purposes. Today DUET boradcasts via Halifax and Dartmouth cable to many homes and learning centres and is broadcasting two courses via satellite to receiving centres across Atlantic Canada. With the exception of two power failures which caused all university classes to stop, a few minutes lost through minor technical difficulties and individual television failures, the delivery system has proved reliable. Those few problems which occur are dealt with by a technician who monitors all broadcasts.

The improvement in transmission has reduced the anxiety of faculty members immeasurably and has resulted in a less frustrating experience for registered off-campus students. Following the 1983 implementation of the new system a student evaluation was conducted: "Was it comfortable to learn from?" 77% responded that it was comfortable or very comfortable; "was the picture easily visible?" 92% responded always or most of the time. [12]

Following the pilot project, careful planning went into the design of an economical but flexible studio/classroom facility. The result is a classroom that is so "user friendly" that some faculty members have expressed a desire to teach all their classes in such a facility. It consists of the following:

- A wall camera operated by remote control from the videc booth, function: to stay with the professor, provide close ups on the board work, and other close-ups where and when deemed appropriate by the director.
- a floor camera operated furing satellite boradcasts by a camera person while, during local broadcasts, it serves simply as a "cover-shot" or wide shot of the classroom and professor, function: to provide a sense of being part of the live classroom experience and to reduce the distracting effect of jerky camera movements.
- an overhead camera, operated by the faculty member, functioning as a hybrid of an overhead projector over which a lecturer can project notes and diagrams and an opaque projector which allows the lecturer to display actual books, pictures and in this case models
- a vtr
- a television chain
- via a series of 4 monitors suspended from the ceiling, on-campus students may see the overhead camera displays, video playback, and the telecini chain
- a network of zone microphones to pick up the questions and comments of the on-campus students
- two speakers over which the disembodied voices of off-campus registrants can be heard
- a director to operate most equipment

The professor need no longer worry about problems associated with the technology - there is a director on hand to assume responsibility for these concerns. During local boradcasts the director or operator of the classroom is a trained student, while on satellite boradcasts the system is operated by a student production team. The following simple production rules guard against the omission of particularly important points and provide a basic visual grammar that the off-campus students may rely upon:

1. Information written under the overhead camera or on the board takes first priority. It must be kept on the screen as each point is made by the lecturer. Where possible, it must be cut back to as the lecturer refers to it.
2. If this type of information must be on the screen for long periods, a small insert of the lecturer must also be on the screen. The off-campus students are thus supplied with subleties of expression which emphasize the commentary.
3. The professor takes next visual priority.
4. If a question is directed to or comes from the on-campus students, the "shot" is immediately switched to the wide shot of the classroom including the students and where possible, the speaker is focused on.
5. The lecturer is encouraged to take command of the technology, asking the director to have diagrams put onto the screen or close-ups of special demonstrations etc.

Technical improvements and the addition of on-site technical support meant movement was no longer restricted - a remote control camera can now follow the lecturer anywhere in the room. The comments of on-campus students can now be heard clearly by off-campus students and off-campus students can be heard clearly by on-campus students.

12 Carl, p. 2



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With systems improvements, training and immediate feedback from faculty became even more important. A faculty operations manual containing a brief background of the program and objectives, potentials of the setting, suggested testing procedures and basic administrative information was developed. A two or more session (depending on anxiety level of the individual lecturer) training program was also developed. The program is simple and casual in the hope that it will reduce the anxiety level of participants. All participating faculty for a given session are asked to attend. They are asked to prepare a short lecture containing as many audio/visual aids as would normally be used during a lecture.

After a brief introduction by the program administrator each faculty member is asked to deliver a lecture. The remaining participants are split up between the boradcast classroom and a mock 'learning centre.' Questions are asked via telephone from the mock centre to give the lecturer practice with the interactive system. The result is often very funny and a relaxing introduction to the system. Lecturers learn to work with and have confidence in the director and leave well prepared for the program. Faculty finish training prepared to use all associated technologies more feeectively, leading to a more satisfying learning experience for on-and-off-camputs students. The effective use of the telephone, for example, can lead to interesting interactions. Off-campus students active in business or various professions can provide a valuable resource to on-campus students. With the effective use of the overhead camera, diagrams and models can be portrayed in unique detail. A computer demonstration can be seen clearly by all.

Now that faculty are comfortable and prepared for the system they can enjoy its advantages. Seeing students and their reactions in the on-campus situation helps to bridge the technology gap for professors. Through observation of on-campus students reactions the lecturer can determine whether his or her point has been made effectively. It also helps to pace the lecture and time the delivery.

It has been our experience that faculty have difficulty in addressing the camera only. While it has been said more than once, "that the lecturer's one weakness (in video teleconferencing) is that he cannot see his students and cannot judge (to the extent that is possible for the live teacher) whether he has the class 'with' him or not . . . The filmed teacher cannot see that some students are not paying attention. In fact, he might be talking to an empty classroom." [13]

While the live classroom broadcast format cannot address the problem of phantom classes, it goes a long way in addressing related problems.

Off-campus students do not undergo specific training. They receive a course outline with an introduction to the program which reminds them that the telephone can play a vital role in the learning experience. Properly trained faculty can elicit comments from them when necessary. Data collected post pilot project indicates that the academic performance of off-campus students is better than their on-campus equivalents. While this may be influenced by factors other than the technology, it is indeed encouraging.

While dramatic improvements have been made since the pilot project, DUET is not yet, nor is it likely to become, perfect. In order to continue to provide a good service to students and a "user friendly" system to faculty, it must continue to evaluate and respond to the evaluation data.

The current objective of the DUET satellite boradcasts is the delivery of Gerontology courses throughout Atlantic Canada as partial fulfillment of Mount Saint Vincent University's mandate to deliver the Gerontology program to this area. Over the past few years Gerontology faculty members have commuted to placed where the demand justified the expense. This method of Distance Education delivery was, at best, a band-aid. It could only service a limited number of people in one place at a time. It was time consuming for faculty and expensive.

Distance can also be a problem within the confines of a city already serviced by six institutions of higher education and, yet, students register in DUET courses. Many students cite time and, believe it or not, distance, as the two main motivating factors. Some say they could not otherwise register in a course. The objective of the local cable broadcast is, therefore, to make education more accessible. But, DUET is more than an educational delivery system. It is the harmony between academics and practitioners; between technology and education.

13 B.R. Bugelski, The Psychology of Learning Applied to Teaching (The Bobbs - Merrill Co., Inc. Of Indianapolis New York, 1971), p. 265.

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# THE ROLE OF TELEVISION IN THE LIVES OF GIFTED STUDENTS

By
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The study around which this report is built is being undertaken by a student in the eleventh grade at Edmonton's Old Strathcona High School for the academically oriented or gifted student. These students are part of the International Baccalaureate Program and it is their responsibility to seek out and pursue some 'worthy' public service. In this case the student, David Paranchych, discovered the volunteer status of those working at the International Television Research and Information Cooperative, the University of Alberta, and approached with a proposal to make Project ITRIC the focal point of his service commitment. It became evident that David was interested in the role of television in his life and those of his classmates. His proposal was reworked to reflect this interest and the mesh it with the work of the Project. This is an interim report in that there is much to be done before David has finished with his study.

The initial proposal for David's study includes a questionnaire designed by him to find out his fellow eleventh graders' thinking on a variety of television related questions. The experience of preparing a questionnaire has helped David immeasurably as he is now preparing to interview several of the group for more indepth results. The subsequent phases of the study will see David expanding to other Edmonton high school for comparison of those populations with the original group of gifted students.

The first portion of David's questionnaire deals with the group demographics and gives us a good cross section view of the "Old Scona" eleventh grade (thirty students).

Agewise the group consists of one fourteen year old, 13 fifteen year olds (6 males/7 females), 15 sixteen year olds (6 males/9 females) and one of seventeen. There are twelve boys and eighteen girls. Most reside in 'traditional' homes with both parents. Sixteen per cent live with a single parent. The group is equally divided between the single child and the multi-child family. Most of the homes are in newer, more afluent neighbourhood.

Parental employment is equally split between one parent and both parents working. The ethnic backgrounds whow 10 Anglo Canadian, 8 Asian Canadian, 4 Ukrainian Canadian, 3 each of French Canadian and East Indian Canadian, 1 Afro Canadian and one 'other'.

Two thirds of the households have one or two television sets. One reported no television set and eight have more than two. Color predominates with one household reported to have five. Two thirds of the group enjoy cable and one sixth of the respondents have pay TV. Only two of the group indicated that they have a television set in their room.

A question that asked them to indicate how many hours they spent viewing television per week brought out the fact that there were three (1 boy and 2 girls) that watch no television. The majority of boys responded that they watch ten hours per week (a mean of 10) and the majority of girls responded with five hours with a mean of seven hours per week.

The question as to what hours were watched also showed a distinct difference between boys and girls. The boys watch prime time with few exceptions. The girls also watch prime time with an equally strong indication of late evening (9 - 12) viewing.

Roughly half of the group indicated that they never mix homework and television and responded in a subjective manner that they 'just could not concentrate with TV on.' Of the rest the boys were less likely, and the girls more likely, to do homework while watching television. The girls were much more likely to leave their homework to watch television.

When given a choice of news sources and asked to indicate the major sources for them one half of the boys included



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television. However, they choose newspapers twice as often and radio as often. One third (6) of the girls checked television; however, radio was far ahead as a news source and newspapers ran a close second. Few in either group chose news magazines.

In responding to questions about commercials most do not believe themselves to be influenced. They watch them because they are there and difficult to avoid. They enjoy the well written and comedic. Except for specific sale-item commercials (jeans, records, etc.) were they see commercials as an information source; they do not feel that they ever buy because of a commercial.

Finally, why do they watch television? The vast majority watch as a pasttime. A small group use it to 'tune out' and about the same number use it as a source of information; as a way of learning (about 25%).

Their choice of programs is what one might expect; comedy, drama, adventure. Surprisingly only one indicated soaps, four opted for sports (Hockey) and only three specified news.

Aside from Hockey (a seasonal extreme in Edmonton this year) the favourite programs wer M*A*S*H (5 votes), Dallas (2), Hill Street Blues (2) and Dynasty (2). The top three characters (more than one vote) were Hawkeye (M*A*S*H 3), Dr. Who (3), and Alexis (Dynasty 2).

In the least favorite program catagory were the A-Team (3 votes), the Love Boat (3) and Fantasy Island (2). The least (each with 2 votes) popular characters were Bo Duke (Dukes of Hazard), Hannibal (the A-Team), JR (Dallas), Tattoo (Fantasy Island), and Webster.

individual likes and dislikes showed a very broad spectrum with 117 different programs and 122 different characters being listed.

Branching out to include computers and the interactive aspects of television; nine of the thirty subjects report having a home computer system and eleven have video game equipment. Five of these have both. The most popular home computer is the Apple and the most popular game equipment is Atari. The games tend to be adventure/fantasy type with some instructional types where younger children are also involved.

The study as structured by David seeks information regarding attitudes as well as hard numbers. His thoughts translated into questions are family oriented and the survey gives his fellow students an opportunity to express themselves about a variety of areas with television as a central theme.

In a 1983 poll of U.S. students, the results of which were published by the National Association of Secondary School Principals, a look at tomorrow showed a positive trend. They like school, mainly for sports and social contacts, and it is not necessarily something to be avoided. They look to the future and want computer courses and foreign language instruction beyond the current capacity of the schools. They want successful careers, happiness and families. They are concerned about unemployment, inflation and crime.

An initial look at the subjective responses by David's eleventh grade classmates shows a trend supporting the US findings. When asked what future direction they would like to see broadcast television take there was a definite call for more informative programming with fewer, truer, and shorter commercials. Their concerns appear to be program centered and not with delivery systems.

When given the opportunity to address where the electronic/telecommunication industry would take us in the future there was less of a universal response. The boys were almost unanimous in their positiveness. The girls were split three ways between being positive, negative and ambivalent. Some of their comments are that the electronic/telecommunication industry will bring about "an at-home society", "world wide television and tv phones", "will be the main information source", and "a better understanding of the universe".

As a final comment the students were asked to address the role of television in their lives. Many took the opportunity to express what they see as shortcomings. They see a need for more Canadian content and public broadcastings (as in PBS) but they also see the need to fund it; probably through commercials. "Television has the most affect (of any medium, which is) unfortunate as good programming is rare", "the standard of television (programming) is too low to be useful". As an insight into the perception level of these students we leave you with this comment: "Programs such as M*A*S*H show you the esprit de corps of the times which one can not ascertain through history books".



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AMTEC '84 ...A Kaleidoscope of Media

# TELEVISION STEREOTYPES AS ROLE MODELS FOR NORTH AMERICAN YOUTH

By

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## NORTH AMERICAN YOUTH: THE AUDIENCE, WHO ARE THEY?:

The human life cycle seems at first sight to be purely a matter of biology. But the sequence of birth, childhood, maturity, old age, and death is also a social one, for its length, stages, challenges, and opportunities depend very much on the society in which one lives.

Every society imposes its own conception of a life cycle upon the physical process of growing up and growing old. The number, length, and content of these stages vary from one society to another. But if a society is to survive at all, it must successfully socialise its members into accepting and effectively performing their changing roles at each stage in the sequence from early childhood until death.

In the course of their development, modern industrial societies have added a new stage to the life cycle: Instead of passing directly from prolonged infancy or childhood to adulthood, youth now pass through adolescence, a period roughly coinciding with the teen-age years. Adolescence is a social invention; in fact, the word came into use only at the beginning of this century. This new stage was introduced into the life cycle as a consequence of extended education. Because of a need for a work force that could read and write, prolonged education therefore became necessary, but this inevitably entailed changes in the statuses and roles of those who remained in school. The result was a large and unprecedented category of people who were physically and sexually mature, yet denied such adult responsibilities as full-time employment and marriage.

Because it is a relatively new stage of the life cycle in a rapidly changing society, adolescence is an ambiguous and confusing period, marked by vaguely defined rights and responsibilities. The North American socialisation process equips people poorly for the challenges of adolescence, for teen-agers are constantly confronted with contradictory demands and presures. The media, for example, extol the virtues of sexual satisfaction and the value of material goods, but adolescents, are usually forbidden full access to either, even though they have the physical maturity to achieve both. Having more freedom than children but less than adults, adolescents are constantly tempted to question or test the authority of parents and teachers. Segregated from other age groups in schools, they tend to form their own subculture, with norms, values, and attitudes that may differ significantly from those of adult society, sometimes to the degree that a 'generation gap' results. Adolescence is therfore often experienced as time of emotional turmoil and confused identity.

### The Influence of the Mass Media Upon Youth:

Although the mass media are unquestionable a powerful socialising influence, the precise impact of the media is difficult to gauge. The most influential medium is probably television. There is a television set in 95% of the homes of youth in the United States, and there is at least one television set in 98.2% of Canadian households where youth live. Between the ages of three and sixteen young people spend more time watching television than they do in school.

The media provide instant coverage of social events and social changes, ranging from news and opinions to fads and fashions. They offer role models and glimpses of lifestyles that people might otherwise never have access to. Through the media, young people learn about lawyers, the police, cowboys, doctors, and even fictional characters such as Spider Man or Dr. Who. The fact that many of these images are not very realistic does not neces sarily lessen their influence. Through media advertising, too, the young learn about their future roles as consumers in the marketplace, and about the high value our society places on youth, success, beauty, and materialism. Changing social norms and values are quickly reflected in the media and may be readily adopted by people who might not otherwise be exposed to them. The rapid spread of new trends in youth culture, for example, depends heavily on such media as youth-oriented magazines, popular records, radio, cinema, and television.

These mass media are a powerful agency for socialisation. In all forms of mass media, from television soap operas to the lyrics of popular tunes, there is a strong emphasis on traditional gender stereotypes (Goffman: 1976; Tuchman et al.: 1978; Williams et al.: 1981).



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Market research has shown that one of the most effective ways for advertisers to reach a male audience is to associate their product, however remotely, with seductive or smiling female models stroking new cars, cradling bottles of wine or being sent into raptures by the smell of a particular pipe tobacco. Advertising directed to women, on the other hand, often shows females delighted beyond measure at the discovery of a new canned soup or thrilled into ecstasy by the blinding whiteness of their wash.

It is interesting that the gender stereotypes used in advertising have changed so little over the past decade. Although some advertisements patronisingly try to capitalise on the growing independence of women - the "liberated women" stereotype - most still portray females as simple minded creatures, bickering endlessly over which toothpaste or fabric softener is better.

One researcher would suggest that to fully appreciate the implications of these stereotypes, one should try mentally substituting men for the women on the screen the next time one is watching television advertising, and note how utterly demeaning the portrayals would be.

How We See the World:

The young learn about their world and themselves in multivarious ways. Traditionally the family, home and community socialised our youth. The medium of television is now part of our home environment. It, too, plays a role. As a major agent of socialisation, television teaches us "how the world works" and how we should behave in it. What "social" lessons are our children and ourselves internalising from our television exposure? Individual programmes may be good, bad, or indifferent in content and presentation but what about the "cumulative experience?" asks Moodsy (1980).

Moody, also suggests, that "television presents us with a distorted definition of reality . . . "

> To the extend that television exposes (us) to diversity of people and ideas it surely expands the boundaries of (our) reality. It is precisely because (we) now rely so heavily on television to define other realities for us that we must examine so carefully what those images are. If they are distorted, inaccurate, or unfair then television's reality is potentially harmful (p. 111).

How Television Distorts Reality:

This distortion of reality is done by omitting, selecting, or combining certain sorts and configurations of "image" for our consumption. Some images depict wealth, status, and looks while other images depict dependent, helpless, weak, and unsuccessful persons, or worst of all, the are not depicted at all. They are not seen on television.

So serious is the relative invisibility of some groups, says Moody, "that Dr. George Gerbner at the Annemberg School of Communication contends 'if you're not on TV, you don't exist'."

The gatekeepers of information, the selectors of images, choose certain images of their creation, to act as our examples:

> sometimes functioning like a magnifying glass held up to the worst of civilization, instead of the best. A fistfight that is (seen) by perhaps five people may be videotaped, broadcast, and "witnessed" vicariously by millions of people.
> ...In North America most people have not witnessed violent acts, yet because of television many (people) have seen many thousands of violent deaths (Gerbner, cited in Moody: 1980).

News coverage of "real" deaths (the Viet Nam War) and "fictional" deaths (crime/action/adventure shows) present us with a violent world in a magnitude that does not exist in reality.

> For many people the relatively passive acceptance of TV fare defines what is typical, what is desirable, what is probable, and what is possible . . .

suggests Chester Pierce (1977). "In fact," he continues, "lower-income people, minorities and youth are more likely to believe that what they see on television represents reality," than other groups.



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Television, like most other experiences we have, affects our relationships with each other by "influencing our feelings about ourselves and our expectations for ourselves and others" (Moody: 112).

Stereotyped Presentations, the Self and Others:

Sprafkin (1979) reminds us that exposure to stereotyped presentations can:

> easily influence viewer's behaviours toward unfamiliar people. Viewers use what they learn from these television images to establish norms for how they will act in certain situations. These images, in fact, teach values and behaviours, expecially to the young who have little first hand knowledge of the real world. (p. 16)

To the extent that children are exposed to certain character portrayals and behaviours on television they may acquire or learn those behaviours and roles and eventually accept them as models for their own attitudes and actions, Moody again suggests.

This writer would agree with Moody that perhaps the most serious effects of these image distortions are to the child's self-image.

> At some level we begin to judge our own meaning, dignity, and worth in comparison with the television characters who portray people like us. How accurate or fair is this barrage of portrayals that we are exposed to each day? What are the portrayals teaching about (the world)? (p. 113).

The World According to Television, how does it work?

MALE IMAGE, female image:

A number of researchers have agreed upon the facts that although women make up over 50% of the population they make up only 30% of the characters on television. 60% of these characters are portrayed by white men, while they represent only 40% of the total North American population. Barcus (1977) identified the same biases in children's television programming with only one in four characters being female, and over 60% of the characters in commercials were males.

Male and Feamel Roles: Are They Changing?

Since the earliest days of television, men have outnumbered women in the video world by three to one. This disparity has not changed during the past decade, although women have attained a larger number of major rather than secondary roles, and certain types of programmes - situation comedies, family dramas, and soap operas - have nearly parity of the sexes. Crime-adventure shows and Saturday morning cartoons score well above the three to one ratio. Surprisingly, an analysis of public television programming showed that 85% of the characters were male, including more than 75% of the characters on the child oriented "Sesame Street" and "Electric Company." One study discovered that three out of every four cartoon animal characters were male (Atkin: 1982).

Many times, women are shown as "fluff", as Moody puts it, addicted consumers who do not figure in the action of the programme "other than, to use Moody's term, "as counterpoint" to the male hero. Women are twice as often shown as "more incompetent" than men.

What Are These Male and Female Roles?:

A. The characteristics of females who do appear on television are not typical of true-population attributes. TV women tend to be younger (mid-thirties and under with very few elderly appearing), and more home bound (only 1/3 hold outside jobs). Occupationally TV women are undereepresented in higher status professions (medicine, law and business). The range of female occupations on television is far narrower than that for males.

B. TV men and women can also be compared in terms of physical traits and behaviour patterns: Males are; relatively more rational, intelligent, powerful, stable, tolerant, aggeessive, and task persistent. Females are; passive, warm, sociable, altruistic, sympathetic, humorous, emotional, dependent, and deferential than male characters. The social interactions between the sexes display a clear dominance by males in giving advice and orders. Although these characteristics follow conventional societal differences between males and females the TV portrayals are more "aggresive" and "stereotyped" than in contemporary reality.



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C. There are few indications that the pattern of sex-role depictions has changed substantially over the past few years. With certain notable exceptions, such as female police officer; "Police Woman," "Cagney and Lacey," and "Hill Street Blues," most of the portrayals of both sexes are still narrowly stereotyped along traditional image dimensions.

D. Rigid stereotyping is even more prevalent in television commercials than in entertainment programming, as advertisers cater to what they perceive as the traditional males and females who constitute the bulk of the market. Women disporportionately appear in advertisements for domestic and personal grooming products, with them set in the home, and in roles as wives, mothers, or decorative sex objects.

By contrasting man, in ads are more often cast in business or outdoor settings. They are shown with cars, appliances, alcohol, and insurance. There were some changes which evolved in the late 1970's. But one distinct sex disparity remains unchanged: more than nine out of ten off-camera voices that provide the authoritative information about the products are male.

E. Concerning identification with TV performers, studies demonstrate that boys relate almost exclusively with male characters; they almost never want to emulate female stars. Girls tend to identify with fewer characters are more likely to select cross-sex models (male) than are boys (the above section was gleaned from Atkin: 1982).

In both Canada and the United States women are not the only group that is less visible on television. Asian, Black, Hispanic, Native, other minority groups are even less represented, and when they are there are problems.

> Racism, like sexim, is conveyed in a variety of subtle ways, both verbal and nonverbal - the quality of a person's speech, the villain's foreign accent, who interrupts whom, who keeps his or her 'cool' in tense situations, and who solves problems (Moody: 1980: 118)

are some of the more subtle ways of informing us as to who is in control, who is important and who "calls the shots."

The Television Family:

Television's contemporary family display "little love and shows scarecly an intact family" (Moody: 120). Family life is noticably absent from programming. Goldsen (1978) studied prime time content for six months and found few heart-warming images." Over 60% of the programmes involved characters who no "noticeable family relations at all."

Goldsen (1978) concludes "images of any emotionally meaningful life in an intact family are almost nonexistent." Those that do are "historical dramas," (Little House on the Prairie, and the "Waltons"); or "sitcoms" ("Happy Days", and "Goodtimes").

Daytime, and evening, soap operas abound with "anti-family" messages as well as depicting some socially undersirable behaviour.

Images of the Self:

As we watch television, we tend to internalise what we see. Some adults, and often children, are willing to let the presented images answer the question, "Who am I?" Often we are willing to allow these images to be models for the patterning of our own behaviours. This can, and perhaps does, affect our ideas about our own abilities and potentials.

Television tells girls, Graves (1979) reports, minority and foreign youths that people like themselves are minimally important segments of the society because they are not recognised (pictured) on television. The portrayal of these, and other groups, represents the degree of respect that the groups are given by society. Since most of the money, prestige and status are assigned to white males, all others may conclude that their group occupies an inferior status.

Our World View:

Why all the fuss about the images and portrayals of people on television? We do not live in isolation from each other. What we see on television may very well affect our human relationships with each other.

> Television erodes our private image. How we see the world is affected by our sense of our own position in society and television changes that position by letting us see from different points in time and space (Moody: 128).

The extent that television creates fair and accurate portrayals, it expands collective understanding. As we develop awareness of effects, we can develop a new consciousness about "justice" and "fairness" in telvisions's portrayals (p. 128).



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The research suggests that male and female role protrayals do shape the attitudes of young viewers of programmes and commercials. Since the predominant orientation of television modeling is traditional sex typing, the impact is likely to be primarily conservative. To the extend that counterstereotypical models are depicted, however, television can serve as a source of learning about the diversity of sex-role options in society.

Teenage Stereotypes:

It has taken television an astonishingly long time to catch its first glimpse of adolescents, despite the fact that they are faithful viewers and have a large, expendable unearned income. It is a rare teenager who see much of himself on a television screen ,and teenagers rarely look for anything else. This generation has been spared the coming-of-age of the Nelson boys, and the righteousness of the father who knew best (paraphrased from Peck: 1982).

Today's teenagers see themselves protrayed as supporting actors used to bolster adult starring roles in such programmes as "Welcome Back, Kotter" and "One Day at a Time," or they are seen as victims of social and psychological problems. The young are either played for laughs, kept suborindate to adult roles, or cast as victims - three states they are anxious to avoid in their real lives. (p. 63).

Peck assures us that television "limps along in persuit of the relevant", but the relevant issues of adults rearely compare with those of the young. He would ask them about their concerns and television. They are often verbal. Television has a far greater hold upon thm than school.

Often skipping school to watch daytime television, teenagers are often critical and judgemental of the characterisations they observe. They have their own standards by which they judge others. They like to look up to characters with whom they wish to associate themselves. (p. 63).

They are not, however, very forthcoming in the current 1983-84 season. "They're not looking for anything new, this young audience." Peck (p. 63) feels they prefer the same fare over and over, watching with limitless patience "Happy Days" every afternoon of their lives. They view, Peck remarks, not for sensation but for "ritual", and the reinforcement of reruns if often more meaningful than the novelty of a special.

Television often exercises more effective control over its teenage characters than North American parents exercise over their own children.

> In the early days, Ricky and David were adjuncts to Ozzie and Harriet, already durable performers. Surely things must have gotten out of hand when one of Gabe Kaplan's supporting sweathogs became John Travolta. Perhaps a reason the young never seem to mention "One Day at a Time" is that Bonnie Franklin as the mother of two (fatherless) daughters is still given center stage and, in her bumbling contemporary way, still seems to know best. Adolescents do not welcome parental control, on or off the screen. They are trying to put all that behind them, and in our society they succeed early (p. 63).

Today's teenagers are in no hurry to grow up. "They have already won all their battles with adults - parents, teachers, and the public - and in this era they live a private life safe from prying eyes" (p. 64). They want a great deal. They speak of power, respect, freedom, employment, and escape (Kidder: 1984; Linton: 1984).

Certain television characters are accepted, admired, and even looked up to. But, to whom should they look to see themselves. What about an authentic adolescent image worth befriending or becoming? It seems to come down to a single figure (Peck: 1982: 64), now nearly immortal, in an enduring series: Radar in M*A*S*H. Even when the Fonzes fade, "M*A*S*H" lasts, gathering up succeeding young generations. By now, they can not remember a world without it, nor anything in it to criticise. Such success is worth a closer look. The following section is a description of Peck's analyses (pp. 64 - 65).

"M*A*S*H" is clearly meant as adult fare, drawn from a long-ago movie the young were discouraged from seeing. It is even set in the midst of a war now rarely mentioned and hardly taught in school. And all of its stars are grossly overaged for their parts.

It is a story about desparate people trapped together in the isolation of war. Without meaning to, they provide a surrogate family for one another. There is considerable warmth in their snappy, snappish dialogue, levened with



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moments of deeply felt, quiet, well-realised emotion and compssion - compassion for suffering, for loneliness, for each other.

They are family not only for one another but also for the young viewer, weary of his own. Colonel Potter, wry and understanding, is the grandfather unknown to the (contemporary) nuclear family of today. Hotlips, the female butt of all jokes, is overaged, oversexed, overloud . . . the teenager's pitiless image of a mother figure. Klinger, lurching through a battle zone in high heels and earrings, is not as audacious as he seems; he is the relentless rebel against the bureaucracy of elders who imprison him; he will never be free, but he will never give up.

And then there is Radar, clearly an adolescent in a world of adults less wise than he. Even his name suggests extraordinary perceptions. He is shorter than the rest, younger, the enlisted man in a hierarchy of officers. Best of all, he is the ideal blend of instinctive wisdom and innocence . . . He is a very quiet little winner. He loves his mother, but he doesn't have to confront her. He is loveable, he is loved, and tends to get his way.

In their reading, adolescents are highly receptive to messages and situations that are too subtly low key to be discovered by television. They like stories of people of good character, but the young will not be preached to, nor will they be dictated to. They will not pay much attention to messages meant to revolutionise their psyches. They want instead stories that inspire them to survive in the world as it is: in their almightly peer groups; in their middle-class standards of propriety; in their unremitting need to be accepted. They do not want the boat rocked; they want to keep from falling overboard. And so they will be drawn to situations they can rise to: success stories that pit the standards of the individual against the rules of the group. There are plenty of such stories that hold out a little light in the jungle of the present-day youth culture, if only television can change enough to find them (Peck: 1982: 65).

The "Terry Fox Story" is one example of how television came in out of the dark and lit many thousands of "little lights in the jungle" for a brief moment of light and joy to young and old alike.

Advertising Addressed to Adolescents:

Moschis (1982) reveals that the adolescent market is of particular importance to marketers of consumer goods for a number of reasons:

> . . . the number of teens, their purchasing power, their influence on family spending patterns, and their formation of attitudes and interests that influence their consumption behaviour in later life (p. 207).

On a programme segment entitled "the New Teens" of the Today Show on NBC in 1980 it was reported that teenagers in the United States, number approximately 28 million. That is more than the total population of Canada. These consumers spent approximately $30 billion on a variety of products in 1979. The largest portion of these expenditures was for clothes ($5.7 billion) and entertainment ($4.7 billion). A number of studies provide evidence to show that the older the teenager becomes the more optional monies they have available. MacLeod-Engel (1983, 1984); Moschis (1982); and Moschis and Moore (1980) point out that females traditionally spend more on items of personal appearance (clothing and cosmetics) than do males, this may be the result of values stressed in North American society.

Business Week reports that teenagers yield a good deal of influence upon family spending patterns amounting to $145 billion annually in the late sixties.

Adolescence is a period during which consumption-related attitudes and interest are formed, patterns of consumer behaviours that are likely to persist well into adulthood, Moschis (p. 207) reminds us. A recent brand-loyalty study prepared by Yankelovich, Skelly and White for Seventeen magazine found that a "significant percentage of women were using the same brands they first chose as teenagers (see "Youth Marketing"). Soft drink manufacturers are especially aware that brand preference develops during adolescence, and they advertise heavily to this market. An advertising executive for Pepsi-Cola recently said, "When you catch them young they stay with you" (Moschis: 207). What else could explain the "Pepsi" "Coke" war. Michael Jackson front and center.



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Advertising and Teenagers:

Advertising to adolescents tends to be limited primarily to products adolescents buy or influence family members to buy. Major categories include soft drinks, sporting goods, clothing (especially jeans), personal care products, models and games, and other entertainment items such as records, movies, video tapes and video discs, and video games. These products are advertised in different media but especially in magazines, on radio, and on television.

Television commercials for products used by teenagers tend to emphasize the nonfunctional aspects of the product such as social significance of the product, group conformity and acceptance. Common themes include humour, fun, excitement, and togetherness. These types of advertisements are believed to be appropriate for teenagers because teenage peer groups are significant sources of influence.

Magazine, Radio and Television Studies:

Magazines and radio are often considered the best media for reaching the teenage market, but the major research studies have focused upon television. One major influence, Moschis (p. 208) remarks, is the effect of advertising on the development of the youth's "self-concept." These studies fall into three categories: consumer roles, occupational roles and sex roles.

Studies examining consumer role perceptions usually focus on either: desirable consequences of advertising (consumer skill building); or undesirable consequences (such as materialistic attitudes and nonrational consumption patterns).

Studies have also looked at occupational role expectations. Most occupational stereotyping in advertisements concerns occupations protrayed by women. Women in commercials have traditionally been cast as housewives and mothers (Courtney and Whipple: 1979). Other research suggests that youths will may develop occupational stereotypes by viewing television commercials. (p. 12)

Very few studies of advertising effects on teenagers self concepts have been done and these are limited to surveys. These effects will, to a good degree, depend upon the "various characteristics" of the individual. It has been found that; members of minority groups, those in lower socioeconomic groups, the young, the the rural are more apt to be swayed by advertising. Moschis (p. 209) suggests this may be due to the fact that teenagers possessing such characteristics are likely "to be more isolated from various paths of experience and that their lack of information may make them more susceptible to exploitation by commercials (Hess: 1970).

How We Are Sold?:

Advertising affects all of us throughout our lives. Adolescents are particularly vulnerable, however, because they are inexperienced consumers and are the prime targets of many advertisements. They are in the process of learning their values and roles and developing their self-concepts. Most teenagers are sensitive to peer pressure and find it difficult to resist or even question the dominant cultural messages perpetuated and reinforced by the media. Mass communication has made possible a kind of "national peer pressure" that erodes private and individual values and standards (prarphrased from Kilbourne: 1982).

> Advertisers are aware of their role and do not hesitate to take advantage of the insecurities and anxieties of young people, in the guise of offering solutions. A cigarette provides a symbol of independence, a pair of "designer" jeans conveys status. Since so many anxieties have to do with sexuality and intimacy and since advertising so often offers products as the answers and used sex to sell, it is perhaps the concept of sex roles that is most deeply affected (p. 211).

Kilbourne has described advertising as the propaganda of our society. It teaches us to be consumers, to value material things above all else, to fee that happiness can be purchased and that there are 30 or 60 second solutions to life's complex problems;

> ans that products can fulfill us and meet our deepest human needs. As a result, objects and things are given very great importance and value, and people are often 'reified' and 'objectified' (p. 212).



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Men, Too, Are Stereotyped:

While women are primarily depicted as sex objects, men are shown as success objects. In both cases, the persona becomes, a thing, and his or her value depends upon the products used.

Although men are allowed and encouraged to become adults, the acceptable images for males are limited too. Men are generally conditioned to be obsessed by status and success as measured in material items and to look upon women as objects, as things to be acquired as further evidence of status. There is a great difference between the portrayal of single men and married men. Single men are generally independent and powerful. Married men are often presented as idiots, as if contaminated by their relationship to women ("Jeffersons," and "Bob Newhart"), (paraphrased from Kilbourne: 214).

Most of us would agree that the model of adulthood that commercials offer adolescents are extremely limited and contradictory:

> Women are supposed to be little girls or superwomen or both. Men are rigidly socialised to repress all feelings of vulnerability, thereby virtually guaranteeing that intimate relationships will be impossible. Motherhood is presented as essential for women and fatherhood as irrelevant for men. (p. 215).

Sexuality becomes a comodity in the marketplace.

Where are We Going?

As we gain understanding about the power of picture media and the socialisation process, we should ask ourselves which images we want to present to our youth. More important, we should ask what kinds of children we want to raise to meet the needs of the future? (paraphrased from Moody: 1980: 129).

But even as we are:

> wishing for resensitisation and respect for life, most of us are watching more and more television - where our feelings are being dulled. In spite of tenaciously held hopes for the future of powerful communication technology in North America, (Canada and the United States), two of the world's richest nations, todays television is the purveyor of demeaning criticism hostility, ridicule, sexual abuse, and intolerence. This is the way it is happening and all of our children are watching (p. 129).

## THE BRAIN AND EDUCATIONAL TECHNOLOGY

By

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The Hemispheric Specialization Issue

We have long classified much of human activity into dichotomous modes. The contrasting modes have included philosophical and spiritual forms observable in nature, as well as more technical constructs. As a means of interpreting human activity, particularly in such diverse areas as conciousness, intelligence, perception and cognitive processes, these classifications have proven useful.

Some common classifications include: left-right; verbal-spatial; analytic-gestalt; intellectual-intuitive; science-art; successive-simultaneous; left brain-gright brain.

While the reality of contrasting modes and organizational patterns has been recognized for centuries, dramatic evidence from research on the human brain has cause new waves of euphoria among educators. The temptation to try to explain educational processes in terms of the actual neurophysiological processes is great. In a paper reminding classroom teachers that awareness of current findings in brain research is essential preparation for future practice,



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Claycomb (1978) typifies the enthusiasm:

> Since the nintsenth century, scientists have know that each hemisphere of the brain - left and right - generally acts as a kind of control mechanism on the muscles and sensations of the opposite side of the body. But the nature of that mechanism and its exact range and manner of functioning is only beginning to be discovered. And although it is not know in great detail what the exact correlations are, fascinating and provocative information about brain function is beginning to accumulate. We seem to be on the threshold of a great repository of new insights and information. (Claycomb, 1978, p. 4)

Primary evidence for hemispheric specialization in the brain has come from the study of brain damaged patients and surgery performed on them. However, considerable confirmatory evidence has been obtained in research with normal subjects. (Nebes, 1977) It has been suggested that since the neurophysiological processes involved are extremely complex and not even well understood by the neurophysiologists, the danger that they will be over-simplified and misunderstood by educators seeking a link with the learning process is even greater. Wim, Bersaker, and Jackson (1983) In their extensive review of the relevance of brain research to instruction and design, Winn and his associates suggest that it is more practical and profitable for educators to use brain processes as merely a metaphor for instruction and design. Metaphorically, the left hemisphere has come to represent the verbal, analytical, temporal, sequential; the right hemisphere is equated with visual, spatial, wholistic, creative, intuitive.

Critics of the status quo in education contend that since there is so much emphasis on the verbal in our schools, the right brain is being neglected. The contention is that we need to "educate the right brain" and provide students with "right brain activities".

Such ideas have recently been condemned since they tend to overlook the importance of both hemispheres participating in the educational process regardless of the subject matter.

Laterality or Synthesis?

Among those supporting the concept that successful learning involves a synthesis or complementarity of the processes of both hemishperes, as opposed to the erroneous assumption that people think with only one hemisphere at a time Levy (1983), a psychologist.

Expressing astonishment at the totally unsupported assertions appearing not only in the popular press, but other sources as well, including educational journals, Levy noted:

> The realization that the whole brain is actively participating in perception, encoding of information, organization of representations, memory, arousal, planning, thinking, understanding, and all other mental operations whether it be social interaction, painting a picture, playing the piano, doing mathematics, writing a story, attending a lecture, or seeing a movie, seems to have escaped many, if not most, popular writers.
>
> Only through misapprehension could some endeavors be attributed to left-hemisphere processes, and other to right-hemisphere processes. The two sides of the brain do differ, and they differ in quite important ways. The nature of these differences has little connection with the popularized picture, however, and the implications for human cognition and emotion are not what has been propogated. (Levy, 1983, p. 66)

The evidence seems to clearly imply that all subject matter engages the specializations of both sides of the brain, and that the overall aim of education should be to guide students "toward a deep synthesis of these differing perceptions." Levy (1983, p. 71)

Some support for the notion of a synthesis comes from the pioneer researchers themselves.

Along with the neurosurgeon Bogan, and Sperry of the Calfiornia Institute of Technology, Gazziniga, a psychologist, pioneered much of the research involving brain-injured patients which led to the laterality theories and support for special development of the right hemisphere. He has conceded, however, that some of the evidence may hint at a certain amound of redundancy in the system during the normal development process, "a redundancy which suggests that all spatial functions are not strictly and exclusively lateralized to the respective left and right hemispheres." Gazziniga (1977, p. 94)



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Many of the original operations were performed by Bogan, a neurosurgeon. He cites the emperical evidence that "there are indeed two apparatuses (cerebral hemispheres), each capable of functioning independently in some degree one from the other; and these hemispheres are clearly different in function." Bogan (1977, p. 136)

Bogan suggests that hemispheric differences are more usefully considered in terms of the way in which material is processed (process sepcificity) rather than the type of material used as a stimulus. He suggests that simultaneous pattern processing seems to represent the appositional right hemisphere as distinguished from the sequential order which characterizes the propositional left hemisphere. (Bogan, 1977)

Nebes (1977) reinforces the above when he notes that the various hemispheric dichotomies which have been postualted:

> ...suggest that the organization and processing of data by the right hemisphere is in terms of complex wholes, the minor hemisphere having a predisposition for perceiving the total rather than the parts. By contrast, the left hemisphere is seen to analyze input sequentially, abstracting out the relevant details and associating these with verbal symbols. Nebes (1977, p. 102)

However, Wittrock (1977) concluded that instruction may often be better when multiple modes are used, not just the learner's dominant mode. Rather than determining a single mode for a learner, the issue would appear to be "the selection of which primary mode is to be excited simultaneously with which secondary one to stimulate an interaction between hemispheres." Wittrock (1977, p. 180)

The important point would seem to be that each cerebral hemisphere makes essential contributions to human performance by having functions complementary to the other. Levy (1983) presented this example of the cooperative synthesis between the hemispheres:

> . . . A full appreciation of the meaning of concepts, of course, includes elaborate sets of verbal associations as well as sensory and experiential associations. When, a normal person hears the word "dog" he or she does not merely derive the dictionary definition, but also generates images of dogs in various postures and activities, recalls the sounds of barks and howling, and probably, recreates the emotions that real dogs elicit. This rich and full meaning of "dog" is derived by an intimate, collaborative integration of the processes of both sides of the brain. Levy (1983, p. 67)

Triune Brain Theories

Recent interest has centered on theories which stress organization of the entire brain as a "triune" or "3-block" entity.

In one popular "triune" theory MacLean (1978) contends that in its evolution the human forebrain has greatly expanded in size while retaining the basic features of three formations that reflect our ancestral relationship to reptiles, early mammals, and recent mammals. The "reptilian" brain (hindbrain) is seen as the control center for the body; it maintains bodily homeostaisi as well as coordinating the muscles for complex tasks. The "Old mammalian" (midbrain) is preoccupied with handling emotions. The "new mammalian" (frontbrain) consists of the two cerebral hemispheres of the "new mammalian brain." Hart's answer is what he refers to as "brain-compatible schools and teaching." He contends teachers would assume a broader, more professional role by directing the whole learning process, while students:

> will be set free (as they are now in a few schools) to move around, talk with many people, communicate, calculate, explore interests, and work on real projects and problems rather than contrived assignments and busy-work. The teachers, happily, will be freed from conducting the classroom rituals that now prove so wearing and frustrating. Hart (1978, p. 396)

The theory of the Russian psychologist, Luria emphasizes function. His three blocks of the brain are concerned with arousal, coding and planning. Components of each functional system are scattered throughout large parts of the brain, though they are located approximately in the hind, middle, and front areas. The respective blocks of the brain interact and function together to regulate human activity and performance. Research based on Luria's model is suggestive of a



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need to design instructio.. which will develop improved attentional, coding and planning processes. Winn, Berbekar, and Jackson (1983) Winn and his associates further suggest that Luria's model offers a much more comprehensive account of learning than the "split-brain" model. While Luria's model is also useful only as a metaphor, it is more complete.

Das, Kirby and Jarman (1979) have developed, and are validating with promising research, a model of information integration which is closely based on Luria's theories, including a proposition that humans can process information by two processes: simultaneous and usccessive.

Relating instruction and design to Luria's model, Winn and associates conclude:

> ...instruction should aim to draw and hold learners' attention, to facilitate the coding and interpretation of information, and to indicate what cognitive strategies the learner should use. This is nothing new. However, what research based on Luria's model does tell us is the instruction should also attempt to: develop coding processes so that information is processed independent of the modality in which it was presented; develop planning processes so that learners can decide for themselves how to best process information, for example simultaneously or successively. These processes will be developed through instructional rather than through physiological intervention. Winn, Berbekar, and Jackson (1983, pp. 24 - 25).

Educational Technology and the Brain

If we accept the definition of educational technology endorsed by a dominant profersional organization (AECT, 1977), we discover it goes something like this:

> Educational Technology is a complex, integrated process involving people, procedures, ideas, devices, and organization, for analyzing problems, and devising, implementing, evaluating and managing solutions to those problems . . . AECT (1977, p. 59)

Most models for operationalizing this definition (instructional design models) are based on theories of purposeful communication, for example Berlo (1960). Such models are commonly based on the "systems approach" and are said to involve emperical methodology. The models have been questioned because of a perception that with such an approach knowledge is predetermined and what students will "think, feel and learn" is predetermined by agencies other than the students. Koetting (1983)

It is the writer's contention that such models are capable of becoming much more flexible than is perceived, and that this must happen since they represent a useful framework for designing and monitoring educational outcomes.

Suggestions that the schools teach to the "left brain" to the exclusion of the "right brain" could perhpas be applied to instructional design models as well. The appearance of linearity contributes to such a view. If one follows literally the instructions provided by the authors of the modeals there is definitely a suggestion that only linear, analytic, intellectual, verbal tasks can be effectively designed using the model.

If we examine the components of a currently popular instructional design model (Dick and Carey, 1978) we discover the following sections: Identifying Instructional Goald; Conducting Instructional Analysis; Identifying Entry Behaviors Characteristics; Writing Performance Objectives; Developing and Selecting Instruction; Designing and Conducting Formative Evaluation; and Revising Instruction. Dick and Carey (1978, p. 9)

Sections of the model which seem particularly relevant for reconceptualization in the light of brain research findings are: Conducting Instructional Analysis; Developing Instructional Strategy; and Developing and Selecting Instruction.

An additional section is more controversial, e.g. Identifying Entry Behaviors, Characteristics. If you subscribe to the theory that we need to be able to determine every students optimum learning style and processing skill, then match the student with instruction designed to accommodate his characteristics, you no doubt feel rigid determination of discrete student characteristics is critical to the entire design process. It certainly would be critical if the design is to incorporate supplanation of events which the student would have difficulty processing on his own, as suggested by Salomon (1979).



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On the other hand, approaches which suggest providing a certain amount of activity to accommodate all learning styles and to develop areas in which the student is deficient, appear promising.

The 4MAT System, developed by McCarthy (1980, 1983) identifies four learning styles based on two intersecting continua: concrete-abstract and active-reflective. The suggestion is that activities related to each of the four resulting quadrants should be included in the design for a unit. As well, activities relating to left and right brain processes would be included in every unit.

The 4MAT model suggests a possible vertical overlay for the horizontal "Developing Instructional Strategy" and "Developing and Selecting Instruction" sections of the model we have been considering.

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# Workshops

### THE BRAIN AND EDUCATIONAL TECHNOLOGY

**Dr. James J. LaFollette**

It would be wrong for educational technology to seek direct guidance from current brain research and try to explain teaching and learning in terms of the actual neurological process involved. However, could the models and hypotheses developed to operationalize educational technology (through instructional design and development) be improved by relating them to neurological models resulting from recent research on the brain?

If we accept educational technology as a process for solving educational problems, we still must recognize that currently available models are heavily loaded in favour of an analytical, verbal, sequential dimension. This presentation will explore and briefly review some theories evolving from recent research on the human brain and attempt to identify possible contributions for an improved operational model for educational technology.

### BRIDGING THE GAP BETWEEN RESEARCH AND PRACTICE: USE OF THE SLIDE MEDIUM FOR LEARNING

**Fred Johnston**

Three decades of research have failed to prove the superiority of one medium of instruction over another. Notwithstanding the negative findings, teachers must still make decisions relating to the vehicles to be used in instruction. The presenter takes the view that teachers should maximize the full potential of those media which are viable for instruction for reasons of convenience and cost, so long as the medium is capable of realizing the desired instructional objective. The slide medium is used as a case in point to illustrate how media affect learning.

A paper will be distributed which identifies the critical attributes of the slide medium, and reviews the research findings relating to the design of messages, the psychological effects of the stimuli on the learner, and strategies for utilization.

The session will be devoted to a presentation of exemplar slides to demonstrate the principles of materials design and utilization derived from a review of the research.

### THE CEMCORP "ICON"

**Gary Collins**

An update on the capabilities and acceptance of this "Ontario Approved Educational Microcomputer" will be presented and demonstrated: indications of the future evolution of the product will be discussed.



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## CHILDREN IN FOCUS

**Kathryn McNaughton**

Move over, Steven Spielberg... You, too, can have the fun (and frustrations) of being a writer-producer-director-editor! Want a video tape or slide/tape to present an early childhood program from your perspective? In this workshop, participants will examine ways of creating audio-visual materials to add interest to classroom presentations or to educate the public about preschool/school age programs. Current, Canadian-produced materials will be used for analysis and discussion.

(This presentation will be of particular interest to early childhood educators in a wide variety of settings.)

## THE CHRONOLOGICAL DEVELOPMENT AND RATIONALE OF ETV IN LONDON, ONTARIO

**Brian Robinson**

Educational trends, political stress and Technological revolution have shaped a unique television and technology service in the London Board of Education which now boasts the highest use of television in North America. Recently changed once more by the addition of computer and microcomputer technical services, this facility continues to advance with the times and technology. A fast paced video tape and question-explanation session will identify forces which attack and support such a high profile service and show how and why it has weathered the storms of controversy and budget cutting.

## "COMPUTERIZING YOUR RESOURCE CENTRE"

**Trevor Barnett (Canadian Data Corp.)**

As our media centres grow, the need to maximize efficiency is very evident. How do we identify our needs, which area should be computerized first? How will this technology effect our staff? Careful planning, the most appropriate system, cost effectiveness and system management are all key elements to success or failure!

## A COMPUTER PLAN THAT GREW

**Ian Hose**

A description of the planning which lead to the East York Board approving a 20 hour computer literacy programme for every grade 8 student and a lab of 15 in every school by September 1984. Part of the concept "East York Schools: Great Places To Be."



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## COPYRIGHT: APPLICATION OF THE LAW TO COMMUNITY COLLEGE POLICIES AND PRACTICES

**Dave MacDougall**

The presentation will begin with a survey of the presenter's own mental transition from contempt for the law to an appreciation of its continuing validity.

The presentation will then consider -

i) - why the law should be respected
ii) - details of the law as it pertains to education
iii) - educator's myths about the law
iv) - the technological reality of the 1920's that shaped the law and gave its intent

Then the presentation focus will alter to examine -

i) - our own Ontario Community College copyright guidelines
ii) - the procedures that were undertaken to make practice comply with these guidelines
iii) - the implementation strategy - its impact upon faculty
- upon our own audio visual and television staff
- the sensitization program we used to introduce the restrictions to faculty - the retaining program that we implemented to redirect our staff
iv) - the complexity of the "public performance" night

The presentation will also consider -

i) - our recommendation for change in the existing laws
ii) - our wish list which emphasizes areas in which we feel we have a moral right to reproduce
- materials but which we would like to see as legal rights within the new copyright law
iii) - comparisons with the British and American laws

## DEMONSTRATION/DISPLAY OF COMPUTER SERVICE TEST EQUIPMENT

**Dennis Speers**

Note: This immediately follows MF5 (Organization of a Computer Service Facility) in the same room.

## DEMONSTRATION OF EKTAFLEX PRODUCTS

**Aaron Backer (Kodak)**

Ektaflex is a quick method of making colour prints from negatives and slides. There will be a demonstration of the Ektaflex Printmaker model 8 (manual) that does up to 8 X 10 and the new motorized automated model 12 that does up to 12 X 18. (Note: the model 8 will be raffled off to the delegates that attend one of these sessions)



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## DESIGNING PRINTED MATERIAL FOR DISTANT AND INDEPENDENT STUDY

**Clayton Wright Ph. D.**

Increasingly, educational institutions are producing printed materials for students who wish to work independently within the institution or at a distance. Good design of instructional print material is essential if optimum learning is to occur.

This session will present practical designs for educational guides/manuals. It will emphasize content and writing style, but will also address layout and packaging. Participants will be required to indicate ideas that have worked for them. If the participants are willing to work in small groups, they could assess manuals produced by their institutions. Those individuals who are ready to write their first manual should definitely attend along with the more experienced writers and instructional designers.

## DEVELOPING CRITICAL VIEWING SKILLS

**Doug Gerrard**

Participants will plan and produce a short television program using the three-camera colour television studio. The session will provide an experience in using television equipment as a teaching, evaluative and communicative tool. Participants will develop a familiarity with and an understanding of vocabulary words related to television production.

## DEVELOPMENT OF LEARNING CENTRE GAMES AND ACTIVITIES IN LANGUAGE ARTS AND MATH FOR PRIMARY (K-3) AND REMEDIAL TEACHERS

**Doreen Pellin, Nancy Rae Oliver**

The major areas to be addressed are:

A) Reasons for using Games and Activities
B) Directions as to the use of Games and Activities
C) Organization of an Activity Block
    1) planning sessions
    2) grouping of students (single and double grades)
    3) physical set-up of classroom
    4) flow of students
    5) evaluation (teacher and student)
    6) record keeping
    7) sample planning and evaluation sheets
D) Use of Games and Activities on a "regular" time-table
E) Short-cuts and tips when making Games and Activities
F) Question Period
G) Examination of Games and Activities on display

To be followed by a Hands-on-"MAKE-AND-TAKE" session (MJ3) in the same room.



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### DEVELOPMENT OF LEARNING CENTRE GAMES AND ACTIVITIES IN LANGUAGE ARTS AND MATH FOR PRIMARY (K-3) AND REMEDIAL TEACHERS

**Doreen Pellin, Nancy Rae Oliver**

Hands-on-"MAKE-AND-TAKE" session to follow the demonstration (MG5) in the same room.

### EXHIBITS

Exhibits are open for the duration of this Session and you are welcome to visit the display booths for all of the time allowed for in this option or any part of the 90 minute time period.

### FILM: MEDIUM OF COMMUNICATION

**Bob Graham**

Participants wil be shown a variety of film titles in order to better understand how film can be used to communicate ideas. The presentation will include discussion about the "elements" of film as a communication medium, heritage, affect on time and space and the affective qualities of film.

### FUTURE DIRECTIONS FOR CJEC

**Richard Holowachuk, from Lake Saskatchewan (CJEC design editor)**
**Dr. Denis Hlynka, University of Manitoba, (CJEC editor)**

This is an open discussion for all those actively involved in CJEC, for those who wish to become involved in CJEC, for any members who would like to provide input, so that we may plan for future issues and future directions of our journal.

### INSTRUCTIONAL DEVELOPMENT: THE ONCE AND FUTURE THING

**Dr. T.L. Bennett**

This session presents an overview of the development of the field of Instructional Development and its antecedent Educational Technology. Included is a consideration of change literature and how educational change interfaces with Instructional Development.

The presentation will conclude with a number of recommendations and implications for the field, as instructional developers attempt to maintain their due recognition and worths in an educational era of financial restrictions.



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### ELECTRONIC FILE HANDLING IN THE MEDIA CENTRE

**Ron Eyre**

This session will take a close look at the use of the computer (specifically the micro) in the media centre setting. Areas discussed will be "booking systems", information access, production of media, accounting and electronic file handling leading to the production of catalogues, etc.

### LIBRARY CATALOGUING

**Brian Bell (UTLAS)**

A computer system for handling the cataloguing of central and school level materials will be demonstrated. This Canadian system is presently in use from Paris to Tokyo.

### MAINTENANCE AND REPAIR OF APPLE COMPUTERS, DISK-DRIVES, CLONES AND PRINTERS

**Don Wilson**

This will be a demonstration of repair and maintenance techniques for the Apple computer. A supporting manual will be available. Peripherial equipment and clones will be covered. Second sources for parts will be discussed.

### MEDIA FESTIVAL

Entries to the Media Festival are available for viewing at this time. Request the specific items that you wish to view. Attend this session for the entire time period or for any portion of the 90 minute period.

### MEDIA FESTIVAL

**Dave MacDougall (Ontario Media Directors)**

All delegates are welcome to view the entries from Ontario Colleges of Applied Arts and Technology. Only members of the Ontario Media Directors may vote on the awards.



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## MEDIA FOR FAMILY STUDIES PROGRAMS

Grace Porterfield

Media in some form is a natural component of every lesson in the Family Studies curriculum. Fortunately, there is an abundance of commercially prepared teaching materials related to people and the way they manage their shelter, food and clothing needs. These are often free or relatively inexpensive. What is available? From whom? Is it relevant and accurate? In what ways can it be used?

Displays of the material currently available will be set up in centres related to the five areas of Family Studies. An illustrated talk will be employed to introduce the participants to the value of media, the role of media in lessons and the variety available. A hands-on experience will be used to establish criteria for analyzing commercially prepared materials. Followed by a demonstration/discussion of a variety of ways to maximize the learning from media

## MEETING THE NEEDS OF THE DISTANT STUDENT WITH COMPUTER-MANAGED LEARNING (CML)

Clayton Wright, Ph. D.

Grant MacEwan Community college installed a computer-managed learning (CML) system to assist in the delivery of its Nursing Credentialling (Refresher) Program to students throughout Alberta and Saskatchewan. In addition, the following courses are being developed for delivery within the College: Basic College English, Diploma Nursing, Library Technician Records Management and Arts Administration.

This session will primarily deal with the implementation of CML to solve the needs of the distant learner. Problems associated with course development, the establishment of the local learning centers, the training of staff, and equipment and software problems will be covered. A detailed discussion of the CML operating system will be of secondary importance. However, those wishing a description of the CML software, may obtain a handout from the presenter at the session.

## MICROCOMPUTERS AS A CAI RESOURCE IN GEOGRAPHY

Dave and Beth Clutchey

The geography classroom lends itself to a unique multi media centre when microcomputers are added to a resourceful teacher's repertoire. This presentation will show how microcomputers lend an interesting dimension to geographic learning in conjunction with slides and overheads using a computer assisted instructional approach.

The computer programs used will be those designed by the presenters and programmed by students of Guelph Centennial Collegiate and The Guelph Collegiate.



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## NATURALISTIC EVALUATION IN ACTION

**Mary Kennedy**

Faculty and course evaluations frequently consist of a computerized form distributed to students at the end of the semester. While results might be valid, they certainly lack depth. This presentation describes a semester-long course evaluation in which many and diverse data-gathering methods were employed. The result is a comprehensive picture of the course, with specific recommendations for improvement.

## THE NEW LITERACY: USING TELEVISION TO IMPROVE COMPUTER LITERACY IN POST SECONDARY INSTITUTIONS

**Paul Avon and Mel Freedman (TVOntario)**

This session will describe the process of research, evaluation and selection which led to the acquisition and implementation of the "New Literacy" telecourse by Ontario Community Colleges.

Content of the learning system will be examined as well as how it is now being utilized in Ontario.

## NEW TECHNOLOGIES IN CANADIAN EDUCATION

**Donna Sharon**

New Technologies in Canadian Education is a series of seventeen research papers prepared for study undertaken by the National Commissions of the European Region of UNESCO. As described in the flyer, this series examines the ways that modern communications technologies (television, radio, film video, audio, telephone, computers, videodisc, videotex, and satellite transmission) are used in many different educational institutions and programs across Canada. The organizations that create programming for these technologies are also described in the series.

This seminar will describe the background and approach of this research project. Some of the national trends and concerns apparent in the reports will be presented for discussion at the seminar.



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### NFB CANADA MAP WORKSHOP

Eric Cosgrove (NFB)

AMTEC '84 participants will be among the first in Canada to see the National Film Board's giant new map of the country (16' x 31.5"/480 cm x 80 cm) and to learn how it, and its companion Resource Kit, can enhance the teaching and learning of a wide range of subjects at the primary and secondary levels.

Unlike conventional maps which emphasize borders, cities, and highways, the NFB Canada Map depicts only the landforms, bodies of water, and vegetation of the country, giving the viewer the impression of looking down on the entire country from a satellite far out in space.

Each workshop will feature: a brief presentation on the design, production, and uses of the computer-generated, hand-painted Map and the Resource Kit; question and answer session; and a Hands-on opportunity with the material itself.

### OPTICAL DISKS AND THE INFORMATIC AGE

Don F. Whitewood

How can we bring the Informatic Age to the classroom? This demonstration will show how the Video Laser Disk can be interfaced to a microcomputer (a 4032 Pet) to provide either an interactive lesson or access to a data base. We will compare the various methods of doing the same thing other ways as to cost, speed of access, capacity and comment on each. A selection of disks will be used in the demonstration to give an idea of what is already available. A look at the whole future of the technology will be discussed using the expertise of the audience. References will be made to suitable reading sources of supplies.

### ORGANIZATION OF A COMPUTER SERVICE FACILITY

Dennis Speers

The set up and operation of a computer service shop. The topics that will be discussed are budget, personnel, shop size and layout, various test equipment, parts and storage, and servicing approaches. Demonstrations of test equipment applications, disk drive alignments and software for servicing.

### POLAROID 35 AUTO PROCESS

Mikeal Wasylik (Polaroid)

Polaroid instant slides (under 3 minutes), instant 8 x 10 prints, and overhead transparencies from slides will be demonstrated.



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### PRINT: COMMUNICATION BY DESIGN

**Bob Graham**

The workshop will include two components: a) Presentation to outline and discuss elements of print design and principles to be considered when using the print medium to communicate. b) "Hands on" session to apply principles of print design. Information from this workshop can be used by participants at a later date to analyse effectiveness of print communication and for design of print communication.

### SHARING OF MEDIA IDEAS

**Bruce MacLean**

AMTEC has set up a committee to organize the sharing of media ideas among the members. This session will be used to discuss ways of doing this.

### TEXT MANAGEMENT WITH THE MICROCOMPUTER

**L.F. (Len) Proctor**

Using the Screenwriter word processor, demonstrate what a word processor can do and how it can be used as a tool to improve personal productivity.

### THE WATERLOO/ECNO BOOKING SYSTEM

**Dave Allen**

An overview of the media booking or reservation system developed by The Waterloo County Board of Education in co-operation with a number of school boards in Ontario. Designed to run on a DEC VAX, the system is now being used by more than ten Ontario media centres.

### WHAT TO DO WITH ONE COMPUTER AND 30 KIDS

**Ron Millar**

A hands-on computer workshop that examines strategies for getting the most out of one microcomputer in a classroom. Participants will explore practical computer activities and discuss classroom organizational strategies.



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SPECIAL INTEREST GROUP - INSTRUCTIONAL DEVELOPERS

SPECIAL INTEREST GROUP - MEDIA MANAGERS

Chairman, Don Bates

SPECIAL INTEREST GROUP - MEDIA TEACHERS

Chairman, Ed Crisp

SPECIAL INTEREST GROUP - MEDIA UTILIZATION

SPECIAL INTEREST GROUP - MICROCOMPUTERS IN EDUCATION

Chairman, Ian Hose